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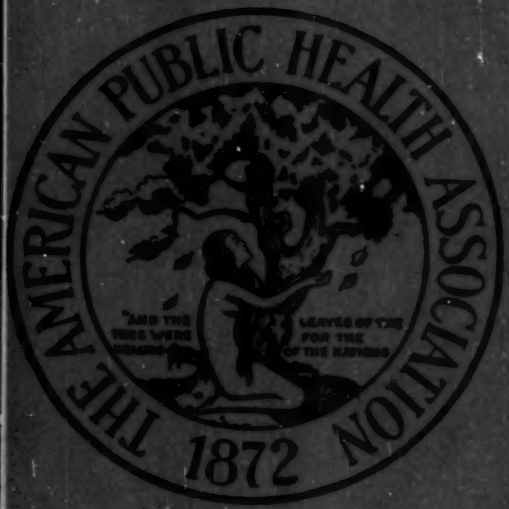

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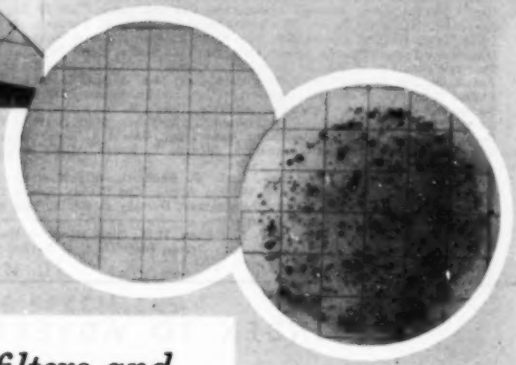

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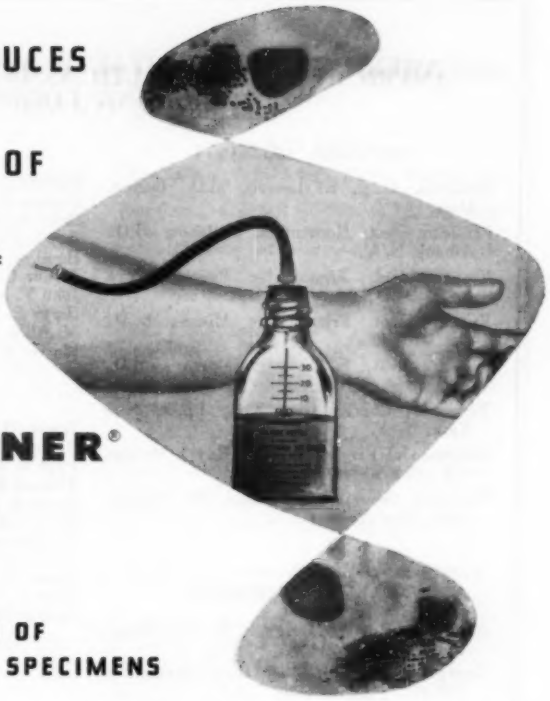

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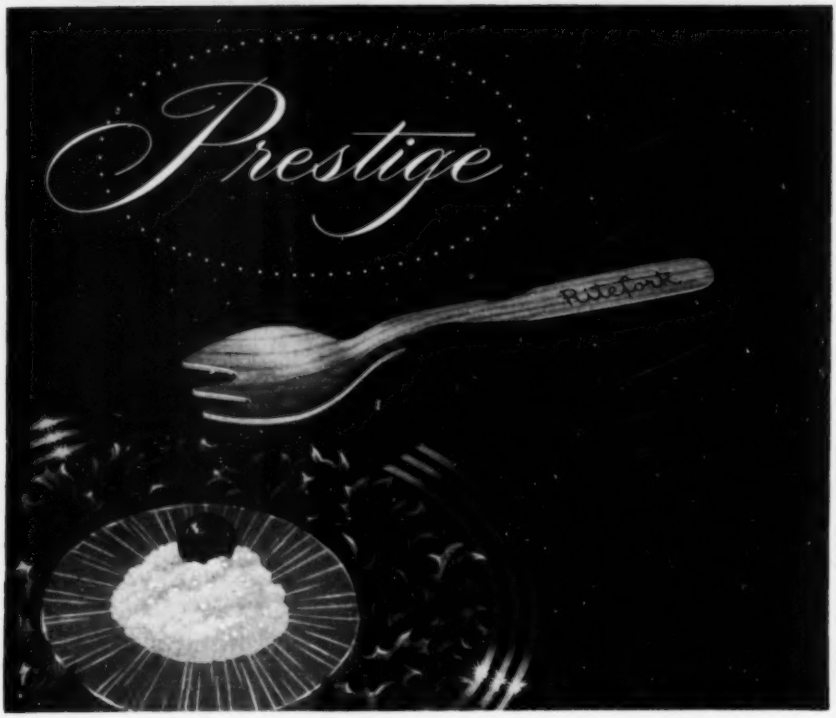

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by Science Writer

Over a hundred million pounds of margarine are used a month as a table spread, a tasty seasoning for hot vegetables and for many other purposes in cooking and baking. Included in the "Basic 7" food list, it serves as one of the finest and most concentrated energy foods. It is a shining example of a food which has been made repeatedly better.

In the original product which was invented more than 80 years ago, beef fats were used. Later these were replaced by lard and then by vegetable oils. When raw the latter, however, had several drawbacks: an unpleasant odor and taste, unsatisfactory color and a low melting point. These have been overcome by scientific refining methods, hydrogenation and use of certified food colors. Strictly phrased Federal Standards sponsored by the industry assure maintenance of very high quality, uniformity and nutritional value.

With this history of product improvement, it was natural that margarine makers would make their food a more valuable one by the addition of vitamin A. For over a decade many brands of table margarine were marketed with a label statement that they contained 9,000 International Units of vitamin A per pound. Now virtually all brands are fortified with vitamin A and the minimum amount supplied per pound is 15,000 I.U.—an increase of over 66%.

Here are some of the benefits which vitamin A supplies. Scientific evidence is available showing that it helps to maintain normal vision and to overcome night blindness; that it increases the body's resistance to infections; that it promotes physical and mental development; and that it aids in maintaining normal glandular function.

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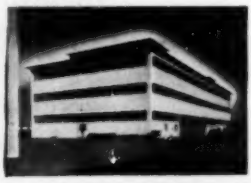

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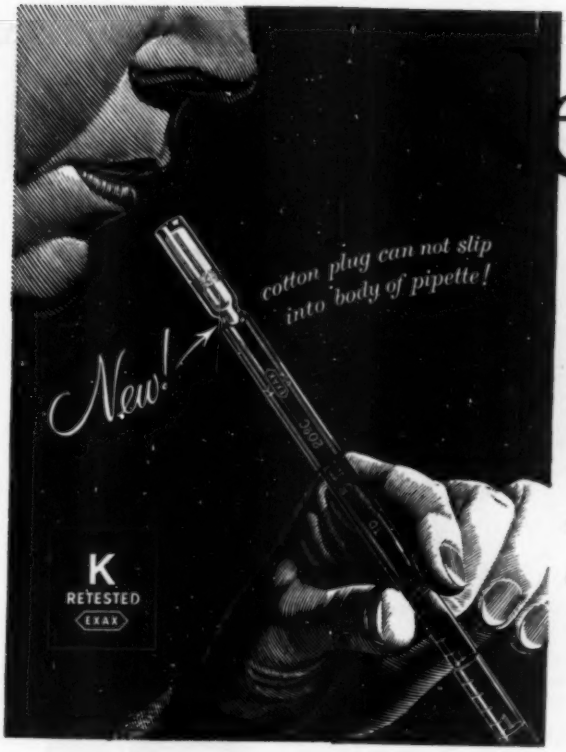

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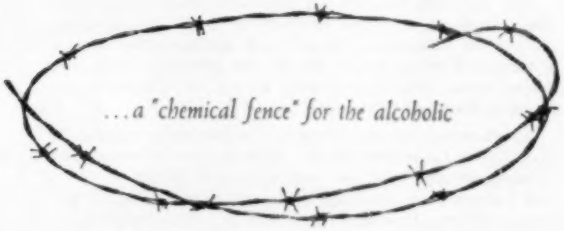

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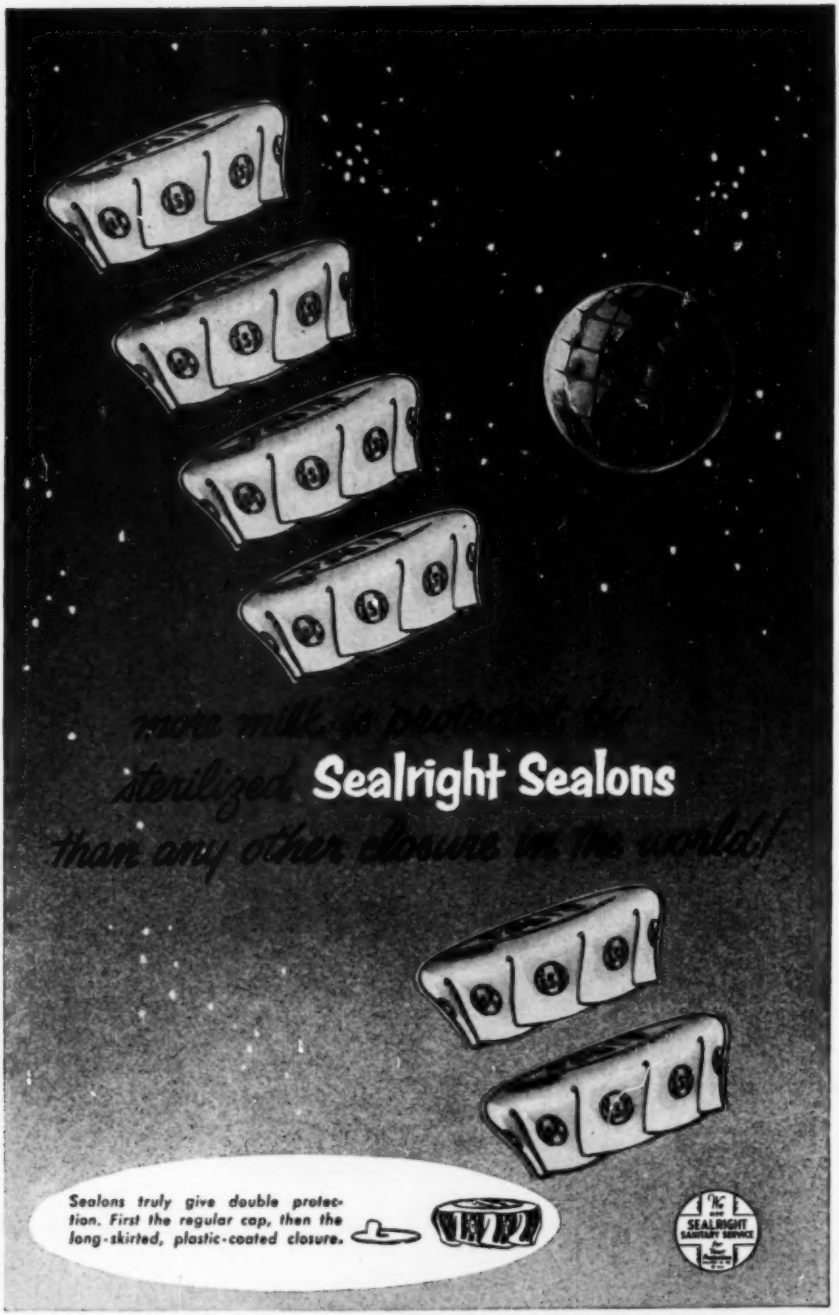
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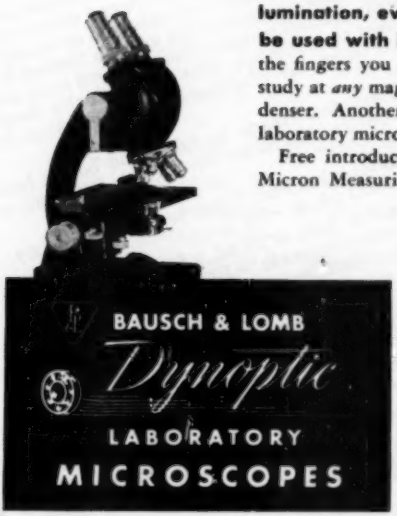

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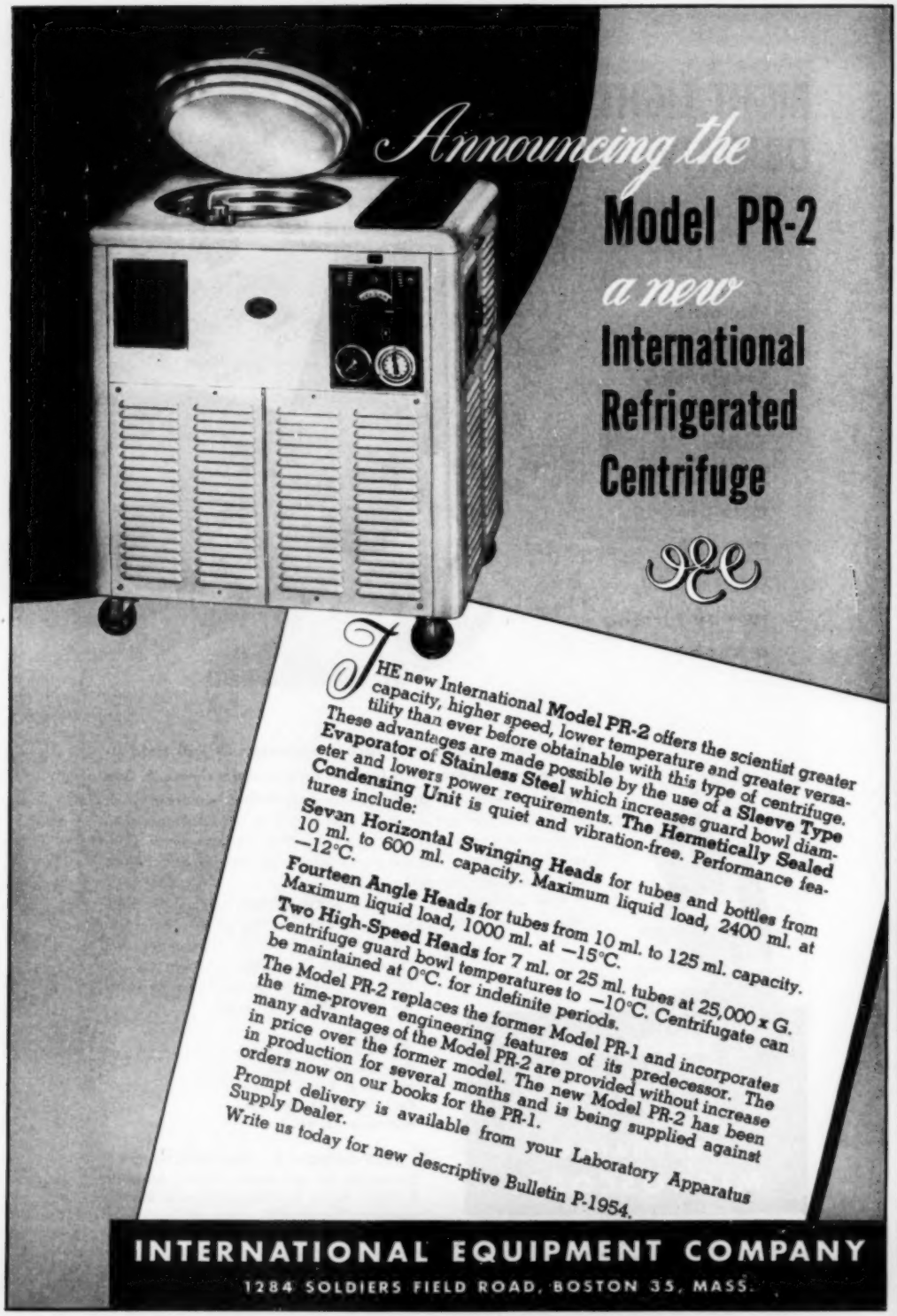

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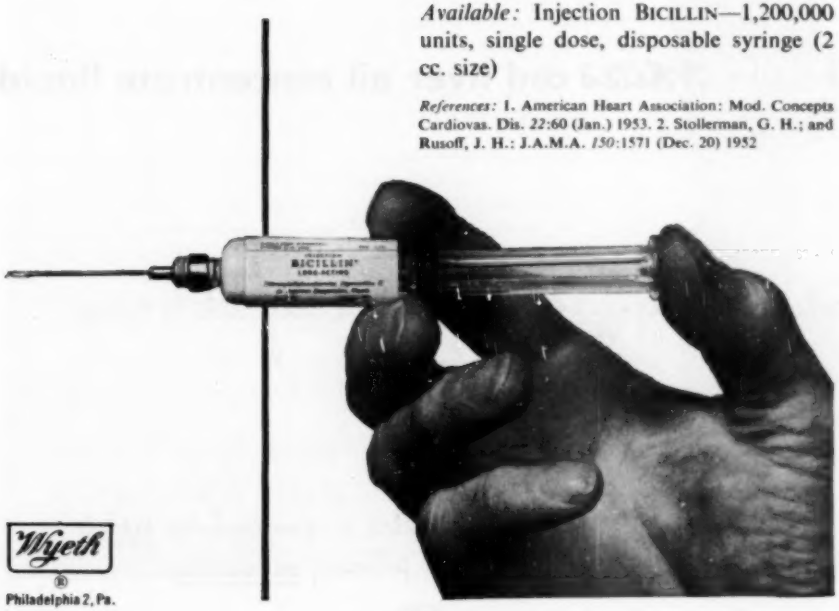

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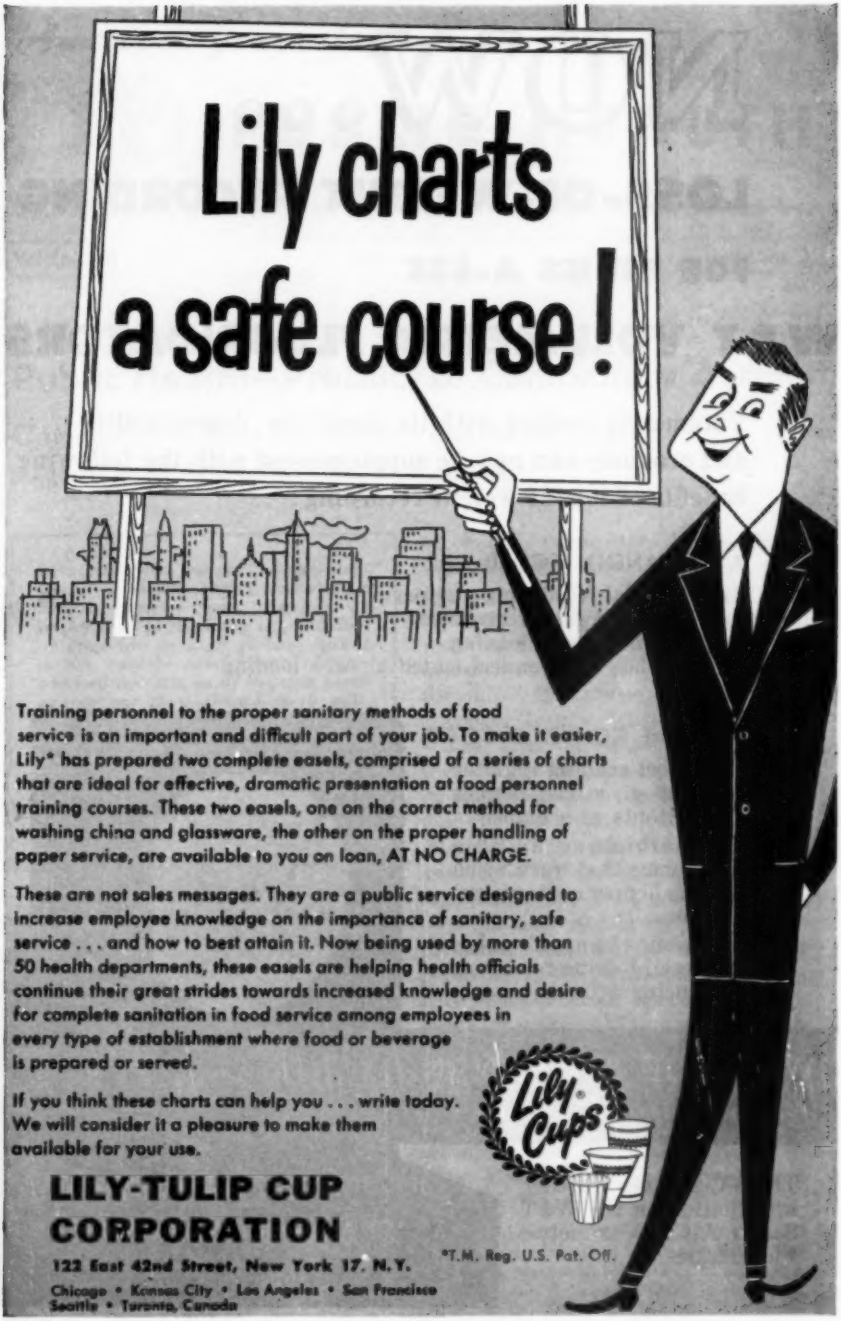

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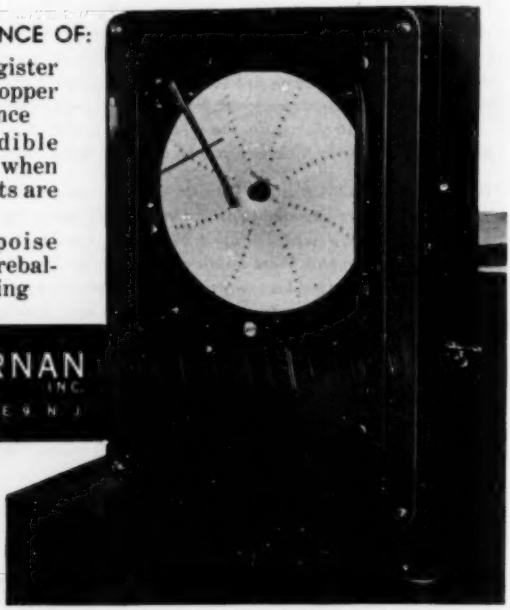

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TP-75-C-2 gives further information on the W&T Series A-635 Volumetric Fluoridator

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American Journal of

PUBLIC HEALTH

Official Monthly Publication of the American Public Health Association, Inc.

Volume 44 March, 1954 Number 3

Public Health—Product of Community Action

Community Action for Public Health—A Report

HAROLD M. ERICKSON, M.D., M.P.H., F.A.P.H.A.

Involving "the people" in the community's public health ventures is sound practice and, happily, a policy that is receiving a great deal of attention in high places—but it is not exactly new! Here are recounted two stories of the way some people put their shoulders to public health's wheel, and one is 27 years old, the other 36.

✢ It is a pleasure to take you to the Pacific Northwest to outline a story of the development of public health in Oregon as illustrated by two local health departments, and to show how this development of sound public health services was dependent to a great extent upon the participation and support of the people whom the departments serve. One of these departments is located at the east end of the Columbia River Gorge, gateway to the Columbia River inland empire. The other is located 400 highway miles away in the rich Rogue River Valley of southern Oregon. The first serves a population of 18,000 people; the second about 60,000. Both were originally sponsored by voluntary public health associations. Both had been maternal and child health demonstration areas and had won national recognition when the United States Chamber of Commerce, several years ago, conducted a health department evaluation contest. One department was organized with the assistance of Social Security funds; the other with the aid of Rockefeller Foundation and Shephard Towner Act funds.

The first, the Wasco-Sherman District Health Department, probably had its beginnings as a result of the formation of the Wasco County Health Association in the year 1926. This association of public-spirited citizens, organized primarily to combat tuberculosis but interested in all public health problems, constantly pressed for better public health services in the county. In 1928, after a small outbreak of diphtheria, the city of The Dalles' schools employed a school nurse, but during all this time, only a part-time health officer service was maintained by the county.

On April 1, 1937, as a result of the encouragement from the Division of Local Health Services of the Oregon

Dr. Erickson is state health officer, Oregon State Board of Health, Portland, Ore. This paper was presented before the First Special Session of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 10, 1953.

State Board of Health and the active stimulation of the Wasco County Health Association, the Wasco County Health Department was established, utilizing Social Security Act funds. It was directed by a seven-member Board of Health, the composition of which is noteworthy because not only was it provided for by law, but it served to bring appropriating bodies, professional people, and the public together. Representatives came from the county, the largest city in the county, the county schools, the city schools, the medical profession, the dental profession, and the public. The staff of the department initially was made up of a full-time health officer, two public health nurses, and a secretary.

It was very shortly recognized that there were many sanitary problems. The water supply of the largest city was found to be contaminated. The milk supply was in sore need of inspection. Abortion was found in the cattle providing the raw milk supply of two communities in the county. These matters were publicized in the press. Through the cooperation of the city of The Dalles, the services of a sanitarian were added to the department. A controversy soon developed over the milk supply. The health department presented the facts to the public through the press and as a result, a standard milk ordinance was enforced, pasteurized milk becoming pasteurized in fact as well as in name, and abortion infected herds eliminated. In addition, the water supply received more adequate treatment.

Many residents of the city of The Dalles were concerned over the health of food handlers and pressed the health department for food-handlers' examinations. The city council prepared ordinances which provided for the examination of food handlers, barbers, and beauty shop operators, resulting in a great deal of discussion in the community over these proposals. The issue became so great that the city council finally referred the matter to the people in a special election. The ordinances carried by a very slim margin, but they carried. This program won many friends for the health department and though it may not have been effective in preventing the transmission of disease through food handling, barbering, or beauty operations, it was effective as part of the venereal disease case finding program.

A preventive medical services program was developed in cooperation with the local physicians, who, meeting as a county group for the first time, helped outline the plan. Provision was made for prenatal and postpartum public health nursing visits, infant and preschool well child conferences, routine school examinations, an extensive immunization program, tuberculin testing, and venereal disease diagnostic and treatment clinics. It was soon obvious that even in a county having only 12,000 population the program could not be developed without the assistance of additional public health nurses, so the State Board of Health designated the county as a maternal and child health demonstration area. With Children's Bureau funds two public health nurses were added to the staff making a total of four, a ratio of one to 3,000 people. With this additional help, and with the assistance of a part-time secretary, a comprehensive program was developed.

In organizing services in the various parts of the county, it became apparent that the people had to be drawn in on the organization and operation of conferences and other services if they were to be successful. One experience in a rural district is worth relating: a very capable public health nurse was sent out to the area to arrange for a well baby, and preschool conference. She called on the mayor, a saddle maker—a job much like that of a country shoe repair man—and several prominent women in

this small community. A well baby conference was arranged; notices were sent out; and all other details were handled by health department personnel. On the selected date, the health officer and nurse, after a trip of some 85 miles, completed the physical arrangements in the building selected for the conference. Several hours were spent in waiting, but no children arrived. Re-checking confirmed the fact that no mistake had been made in the day or hour. Parents just did not bring in their children. This failure was discussed with a community leader who could not understand the lack of response, for as she said, the clinic had been well publicized.

Arrangements were then made for a meeting with the one and only women's club in the area and this organization was asked to sponsor the conference. The members were given the responsibility for making appointments; for transporting mothers and children, if necessary; for keeping the conference rooms clean and in order; and for furnishing volunteer clerical assistance. They accepted this assignment enthusiastically, and worked hard. It is noteworthy that during the first three months of operation every infant and every preschool child in the area was seen at the conference. It is also worthy of note that, in 1939, when a real question arose over the appropriation of the county's portion of the health department budget, these same women—in addition to women from other areas of the county, the health association, and service clubs and organizations that had worked with the department — heartily supported the budget. They stated that they had received more service from the health department "than from any other agency of county government." The county provided the appropriation. Soon afterward, a Crippled Children's Clinic and Child Guidance Clinic were established in the county.

A suggestion was made that a community health council be established. This was never implemented, however, because members of some of the active associations and clubs assumed that there already was sufficient organization in the county to correlate and carry on health activities. However, when the health department undertook an evaluation of the public health needs of the county and of the program that was being carried on, it was thought advisable to bring the community activity into this evaluation. To this end, the Chamber of Commerce of The Dalles, the largest city in the county, was induced to establish a health committee and in cooperation with the health department it entered the evaluation contest carried on by the National Chamber of Commerce. Volunteers were recruited to help obtain the data necessary to complete the evaluation schedules, and in this way these volunteers learned a great deal about the department. Everyone concerned was happy when the health department won national recognition.

About this time, Sherman County, a neighbor of Wasco County, having a population of about 3,000 persons, appreciating the service being offered in the neighboring area and being unable to provide this type of service alone, asked to share in the program. A voluntary arrangement for a district health department was made providing for the employment of a fifth public health nurse, thus continuing the one nurse per 3,000 population ratio. Services were extended to Sherman County. In 1947 a state law, providing for district health departments, formalized the arrangement. Real progress was made in the reduction of communicable disease, infant and maternity mortality rates, in screening children for physical defects, in getting them to their own physicians for correction, and finally in improving sanitary conditions in the county. Good service was being

rendered, and through citizen participation in the program, through the sharing of the services, and through good publicity, the public understood and supported these services.

World War II, with its demands for physicians and nurses, accounted for the loss of first the health officer and later the public health nurses. The county was anxious to keep the staff, but a health officer could not be retained for such a small population when much larger populations in the state were going without service. The county continued, however, to maintain the budget and to attempt to recruit a staff. After the war, it was again possible to obtain the services of a physician and a limited staff of public health nurses. Wasco County and The Dalles are now "booming" as a result of the construction of The Dalles Dam on the Columbia River and the building of a bridge across the Columbia River at The Dalles. Community organization for health is not as well developed as it was. There has been a large influx of people who will have to be acquainted with its activities. The health department is, however, an accepted department in the community. Its total budget has been increased very little over the $1.50 per capita of prewar years, although federal funds, which have been withdrawn to a great extent, have been replaced with local funds.

In this area, a small community, ordinarily considered not large enough to maintain a health department, organized and developed one. After finding out that the benefits of a health department were as great or greater than they had anticipated, they continued to fight for it and now tax themselves to maintain it. It seems that the health department, after it once was established, assumed the primary responsibility for publicizing the activities of the department and for working with various organizations and volunteer groups. Adequacy of staff made it possible to provide health services to a large segment of the population, thus enabling many people to see at first hand their health department in action.

In the second county, Jackson, the health department had its beginnings in the organization of the Jackson County Public Health Association, which was formed February 15, 1917. This association had as its president, a Mildred Carlton. Ordinarily one would not mention names in a report of this kind, but we cannot review the records without being impressed with the great part that Miss Carlton must have had in the development of the public health program in Jackson County. Thus, to omit her name would be a great oversight. She apparently, on a voluntary basis, devoted a large part of her time to the promotion of public health services. The Jackson County Health Department was organized on January 1, 1925, "by a group of taxpayers," who saw an opportunity of cooperating with the State Board of Health and the Rockefeller Foundation, utilizing Shephard Towner Act funds, Rockefeller Foundation funds, and local moneys. A full-time health officer, two public health nurses, and a secretary were employed. The population of Jackson County at that time was 30,000. The early program of this department included a considerable amount of indigent medical care, although a fairly comprehensive preventive medical service program was developed. This included maintenance of 14 well baby conferences, tuberculin testing and x-raying, operation of crippled children's clinics, a preschool and school program, and the development of a sanitation program.

In reviewing newspaper clippings on early activities, it is difficult sometimes to differentiate between the voluntary health association and the official health department. Each apparently was sponsoring clinics. This undoubtedly

reflects the extent to which the voluntary association, composed of "many of the most capable women of our city—most of them social leaders," and the health department cooperated. Miss Carlton helped with publicity, gave many public talks, and organized a dental health clinic, a crippled children's clinic and a child guidance clinic financed largely by the public health association and various service clubs, the clinics being held in the health department quarters. It is significant to note that a "health honor roll" parade was held on May Day, 1929. Some 1,000 children who merited recognition for their interest in an improvement of their own health took part in this parade.

A crisis in health department financing developed in 1929, when Rockefeller Foundation funds were withdrawn and the county budget committee failed to appropriate the funds. Newspaper headlines carried the word; "Fate of health unit in balance"; "Unit fails to secure funds." It is reported that letters poured in from all parts of the county urging the county court to support the service. Parent Teacher Associations, the public health association, and individuals supported the budget. A delegation from the county, headed by Miss Carlton as their spokeswoman, appeared at the county budget hearing. The court announced that they had had so many letters protesting the cut that it would not be necessary for the hearing as the county court had decided to budget the necessary funds to continue the services of the health department. From this time on the health department developed steadily, providing expanded public health services to the people of the county. The health association continued its active support. Some seven branches of the association were organized in the county. One of these at Central Point, sponsored a public health center, a branch of the health department. This was first located in a store building, and later, with voluntary contributions of labor and materials and with other items furnished at cost, a health department center branch was built. In 1938 when the present health officer assumed leadership of the health department, the staff consisted of the one health officer, five public health nurses, a sanitarian and a clerk typist. Today the staff consists of one full-time health officer, nine public health nurses, two sanitarians, one laboratory technician, a health educator and two secretaries. In 1946, a second sanitarian was added when the city of Medford and the county health department were combined. A well equipped laboratory and a laboratory technician were likewise added at this same time. In 1952, after an intensive chest x-ray survey, during which 70 per cent of the adult population was x-rayed and the value of a health educator in community organization was ably demonstrated, a health educator was added to the staff. Plans are now being made, working with a community group and particularly with the health association, to expand a child psychiatric service and employ a full-time psychiatric social service worker. The county this year provided a $2,500 budget for mosquito control. The health department and the health association are now jointly engaged in a "community health needs survey." Welfare medical care has been divorced from the health department program for many years.

Typifying the interests of the community in health is a rather unique memorial, the "Sparrow Memorial Clinic Fund." This was originally promoted by Miss Carlton at the time of County Judge Sparrow's untimely death. It was suggested that persons wishing to do so, contribute to the fund rather than send flowers. There was an enthusiastic response. Because of Judge Sparrow's great interest in public health,

the fund is used to equip clinic facilities and to maintain them in the health department for such things as well baby conferences, tuberculosis clinics, crippled children's clinics, dental clinics, and for similar activities for children. Recently a fluoroscope was purchased from this fund. This memorial has been continued with a large scroll located in the health department offices on which is inscribed the names of persons in whose memory funds have been contributed. In the words of the present county health officer, Dr. Merkel, "We could go on and on with some of the interesting stories about the early health activity development in Jackson County. However, there would be no place to come to a halt." In this county the health association, with its extensive organization and branches throughout the county, has undoubtedly been a primary means of first organizing and giving pioneer support to health activities, and later in interpreting health department services to the public. The health association, made up of volunteers and the official health department, together gave leadership and developed the health services with other interested citizens.

In all three counties — Jackson, Wasco, and Sherman—it is obvious that when given leadership, direct or "submerged," and when offered the opportunity to take active part in planning and in carrying out the program, the people enthusiastically respond by providing good ideas; capable volunteer assistance, and the necessary finances for community health services. They built economically sound, lasting programs as they coordinated their efforts and brought their official health activities together in efficient health departments.

ACKNOWLEDGMENT — Appreciation is expressed to A. Erin Merkel, M.D., and E. Noel Smith, M.D., who furnished a large part of the data presented in this paper.

Social Hygiene Day Is April 28

April 28, 1954, has been selected to observe the 18th annual National Social Hygiene Day by the American Social Hygiene Association and its 200 state and local affiliates. The slogan of this year's observance is, "Educate Tomorrow's Parents Today."

The American Social Hygiene Association has prepared a manual designed to show how community groups can pool their experience and skills in behalf of social hygiene goals—education for personal and family living, strengthening family life, eradication of the venereal diseases, and suppression of commercialized vice. This manual is available on request, together with further information from ASHA's Division of Community Services, 1790 Broadway, New York 19.

The ASHA will combine its annual meeting and National Social Hygiene Day Observance in a luncheon conference at the Hotel Statler in New York City on April 26, two days in advance of Social Hygiene Day. At this time the association's annual William Freeman Snow Award "for distinguished service to humanity" will be presented.

Public Health—Product of Community Action

How Does a Community See Its Needs?

RICHARD W. POSTON

In two western states a fine sociologic experiment has been in progress for some years. Its purpose is to develop methods for improving the quality of all community services—not just health—through the activity of the civic-minded local people, themselves. Public health services have been found to benefit, but they are not the sole beneficiaries of intelligent community action.

✣ In recent years there has emerged in virtually every professional field a rapidly growing interest in gaining community participation for the accomplishment of professional aims. Probably, this is some indication of an increased recognition of the fact that professional goals can be more readily attained with public support than they can be without public support.

As a result we now find in our communities a new brand of social organization. One professional group is organizing citizen advisory councils for the public schools, and another is asking the community to learn the values of city planning. There are recreation councils, social welfare councils, economic development councils, local health councils, and a wide variety of special survey groups designed to promote community action in some specially designated field.

Many of these groups are representative of various professional agencies, but lay members are always sought after, and the letterhead with a long list of influential names printed down the left side of the page is common procedure. Many an influential citizen whose name is a sure bet to make at least a dozen letterheads during the year is unaware of the organization's activities, but the name adds weight to the stationery without increasing the postage and there is always hope that it will add pulling power for community support.

All this activity has grown out of a recognition that not only public health, but virtually every other public gain is in the final analysis either directly or indirectly a product of community action. But in the process of bringing about all this activity we have made one mistake—instead of integrating the community we have tended to fragment it even further. The same few usually do all the work and the same majority usually are not interested. Hundreds of efforts end in failure, and the stories of genuine community action are still rare enough to make news.

The result in the community is not to be unexpected. There is one group of people who are not interested in anything except school matters, another confines its interests to the promotion of business, another will not do anything outside of the church, another will

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think only about recreation, another is political, and still another will not listen to a conversation that concerns anything except public health. Then too, in each community there is that one vast unorganized group—including the majority of the citizens—in which there is no interest in any public goal or in any phase of community improvement. Thus, the community tends to become an assorted collection of groups who have one-track or no-track minds, and the term "community project" means actually a project of one of these special groups, or of one of the myriad of councils devoted to the development of some particular compartment of the community corresponding to the objectives of whatever professional group caused it to be organized.

Under these conditions community life loses its vitality; the community is no longer whole. The individual tends to lose his sense of belonging, and with this goes his feeling of importance and his desire to participate. Men tend not to be considered as whole human beings, but as pieces of men characterized by a special set of needs which may be isolated from context and dealt with as though they were an arm or a head detached from the total organism of which it is a part. The great problem is that we have, each in his own specialized way, become so absorbed in the need for community action in a single area that we have tended to forget the community.

Public health is not only a product of community action, it is a product of the community itself. There is no such thing as a health problem existing all by itself any more than there is any such thing as a school problem or any other public problem existing all by itself. The real problem is the community. For the health of the public, or the state of physical, mental, and social well-being of the people who make up the public, is a product of the community in which it exists, and is in some vital way related to the total complex of community functions. Life is not a part, but a whole, and in this respect a community is no different from an individual.

Uncontrolled sewage disposal, the presence of insanitary privies, a lack of adequate provision for the handling of garbage, a general neglect of the care of children, a toleration for inadequate provisions to meet the needs of the aged, nursing homes that are permitted to operate below minimum standards, social conditions which make for human frustration and a low level of mental hygiene—all these are symptoms of the kind of life that goes on in the community and are the products of that kind of a community. Through the promotion of community action in that special area of the community labeled "health" we may relieve certain symptoms, but the basic ill that is responsible for the symptoms may remain entirely untouched.

Certainly, this basic principle has been recognized by the health profession. By definition, we have said through the World Health Organization that health is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." With this point of view we have learned that the health of a community cannot be separated from the context in which it functions. Public health must embrace the total complex of factors that go into the making of a community. Some of these factors may seem to lie entirely outside the field of health; yet the influence of all factors in the total community are a vital part of what makes and conditions the health of the public.

The level of physical, mental, and social well-being of the people who make up the community is influenced by their economy, their schools, their churches, their civic organizations, their

pattern of recreation, and by their whole basic social structure. Public health is not something which can be found in the health department, rather it is in the neighborhoods where people live. It is in the human network of formal and informal relationships, in the places of employment, in the family, in the church, and in the kind of quarters in which people are housed. It is in the streets, in the alleys, in the vice, and in the places of entertainment that exist in the community. It is in the mental attitudes, in the customs and values of the people. It is in everything and in every place that is a part of the community. Thus, the health of the public will be no better than is the social and economic environment of the community.

Public health is, indeed, the product of the community, and its level can therefore be raised by the action of the people. But to accomplish this action we need to look at the total community. The basic problem is not merely how to form a citizen's group to establish a health department or to accomplish any other result in this single area that may be classified as health. The basic problem is the need somehow to design, to mold, to create, and to build a kind of community that will produce in the process of living a higher standard of public health.

People need to get concerned not with their public health, but with their community. If the community itself is functioning as a mature and integrated social unit there will be an alert and informed citizenry. There will be an atmosphere in which the spirit of progress can grow. There will be an open recognition of local needs, a willingness to face problems constructively and realistically, and a common desire to get behind whatever action is wholesome for the community welfare. Within the dynamics of this kind of a social framework, the services of a modern health department will be provided, the functions of adequate hospital service, of health education, of protection against disease, and the resources of all other needed health facilities will be sought after and utilized—for these are essential elements in the building of a good whole community. If, in short, the problem of the community itself can be solved, then the level of physical, mental, and social well-being of the public will be lifted—for community action geared toward the total improvement of human living will become an integral part of the community's whole pattern of behavior.

During the years from 1944 to 1947, an experiment in community education known as "The Montana Study" was carried out in Montana under the direction of Baker Brownell, then professor of philosophy at Northwestern University. The purpose of this experiment was to develop methods for improving the quality of living in the communities of Montana. At the end of three years it had been conclusively demonstrated that by developing a concern on the part of local residents for the total life of their community, people began to express themselves in action that reached out into every aspect of the community's structure. Public health workers, as well as other professional workers dealing in social problems, began to find that their job was much easier in the communities where the experiment had been conducted than it was in other Montana communities.

After four years of research into the operations of this experiment, it was my privilege in 1950 to organize a similar program at the University of Washington. Using the same basic philosophy of community life that had been demonstrated in Montana, we developed in the State of Washington a comprehensive program of total community development.

The initial approach consists of the

organization of a community self-study and action program embracing the total range of community life. A consultant from the university works with the community throughout the initial study, but the whole program is carried out entirely by local initiative, and the university does not begin the work in any community without a clear invitation from the people who live there.

For a period of five months the citizens of the community come together once each week in the form of an old-fashioned American town meeting to discuss all aspects of their own community, to discover and identify the causes of their problems, and to work out their own solutions. Hundreds of people from all interests and all sectors of the community may take part. By means of "buzz" sessions everyone has an opportunity to express his opinions and make recommendations for action in every area of community life.

Through a series of research committees which provide the facts that are needed for the discussions at each weekly town meeting, the total community is brought together into one integrated study. All groups, interests, organizations, and agencies are united in a single effort focused on the community as such. People who ordinarily do not participate in any community enterprise become actively involved.

In the State of Washington the program has now been established for slightly more than three years, and again as in Montana, the effectiveness of the effort has been clearly demonstrated. Out of the study comes unity and a common awareness of local needs. From this comes intelligent planning for community-wide effort in which the people can act together, not as organizations and specialized interests, but as citizens of the community in which they live. Under these conditions health problems tend to melt away because the community itself is becoming a healthier place in which to live. The stresses and strains of fragmented effort are broken down, social barriers are overcome, and instead of the professional having to convince the community that his service is important before he can obtain the necessary facilities to do his work, he now finds the community demanding his services and providing the facilities that are needed because the people who make up the public have become concerned with the total well-being of their community.

In one of these communities the publicly owned hospital was on the verge of bankruptcy. Internal factions had split the personnel, and a point had been reached where no one could give a clear accounting of hospital operating costs. Public relations had deteriorated to a state of personal name calling. This was the only hospital in the county and more than 20,000 people depended upon it. One wing had already been withdrawn from service, and month after month all efforts to reverse the situation ended in failure.

Then from a common interest in community improvement that grew out of the community self-study, something happened. Inside this community the citizens as a whole were becoming concerned for the future of their town and began to recognize that public apathy toward local needs, including the hospital, was in itself their most serious problem. Not until the people had begun to look at themselves as a community and to discover that their future was in their own hands did they begin to realize that the hospital, as other municipal facilities, actually belonged to them and that in the final analysis they were responsible for the well-being of these facilities.

Within a few weeks the matter was being thoroughly aired at their weekly town meetings and the entire community had become interested. Misunderstandings began to disappear and a

plan of action was recommended. The first change came with a reorganization in hospital administration and further changes followed in rapid order. In the health committee's report which was discussed throughout the community was the quotation, ". . . the right to health belongs to everyone. But with that right goes the obligation to support the facilities that make that right possible. We cannot ask for something important and not give in return. Each community will get the kind of hospital care it deserves. The greater the concern of the public, the stronger the spirit of the hospital and the better care each patient will receive."

That was six months ago. Today the hospital finds itself in a climate of community cooperation and support. Old conflicts are gone, modern business methods have been established, nurses' salaries have been raised, employee morale is up, and the hospital is out of the red. But this same spirit is alive in all areas of the community and is going forward on every front. In this town people are concerned with a common objective of making their community the best place in the world in which to live, and they know that this cannot be done without adequate facilities for the public health.

The community study was not focused specifically on the hospital problem, or on any other single problem. It was focused on the community. But from that focus the people themselves set in motion a process of democracy in action, which by the very nature of that process, must permeate every area of the community structure. The release of direct action for the solution of a specific health problem—in this case the hospital—was simply a natural function of that process. It did not have to be promoted as a special health effort in one narrow segment of the community where under usual conditions only a certain few are interested. By integrating themselves into one complete community effort, all interests evolves into one interest—the community itself. Action in the field of health was inevitable because the field of health is an integral part of the community.

In seven Washington communities this same process resulting from the community study and action program in three years has expressed itself in terms of the development of economic resources providing hundreds of new permanent jobs, the reduction of public assistance needs, the streamlining of local government and the passage of state legislation, new roads, improved streets, new street lighting, and the painting and beautification of whole towns; improvements in local fire districts with a substantial lowering of fire insurance rates; the acquisition and construction of community parks and equipment, the development of community-wide recreation programs, the construction of new school buildings and expanded educational programs for both young people and adults; substantial increases in voter turn-out; the cooperation of local organizations after years of pulling apart, the formation of church councils and a large increase in church attendance; the expansion of local health departments, the cleaning up of insanitary sewage conditions and improvements in municipal water supplies, new garbage disposal systems and equipment, expanded chest x-ray and immunization programs; and above all a spirit which motivates community action as a habit of living.

In the State of Washington requests for the program have now been received from more than 80 communities, and this year under the direction of Jack E. Wright the work is being greatly expanded. At Southern Illinois University we are now organizing the same

program, and other state universities are hoping to get it started in their states.

The total community self-study is no panacea any more than is any other program. But it does cultivate the unity of community life, and with unity comes a common interest in the solution of all local problems—health included. Under these conditions, community action for better community health is inevitable. If, then, we can make the community itself our primary concern, instead of confining our efforts to one specialized part of the community, I believe that the results will come more quickly and more easily. For when the day comes that people in local communities throughout all America are willing to take the destiny of their community in their own hands and mold it for themselves, then on that day we will witness the greatest action in all history for the complete physical, mental, and social well-being of our people.

Public health is, and can only be, the product of the community in which man lives.

American Board of Preventive Medicine Examinations

The American Board of Preventive Medicine announces examinations for certification in preventive medicine and public health at the following universities on April 22, 23, and 24, 1954:

University of California, Berkeley, Calif.
Harvard University, Boston, Mass.
Johns Hopkins University, Baltimore, Md.
University of Minnesota, Minneapolis, Minn.
Tulane University, New Orleans, La.

Request to attend examinations at any of these places should be made to the secretary of the board at the earliest possible moment. Examination fees must be in the secretary's office prior to the examination date. Dr. Ernest L. Stebbins, Secretary-Treasurer, 615 N. Wolfe St., Baltimore 5, Md.

Examinations also will be given in Buffalo on October 9, 10, and 11, at the time of the Eighty-second Annual Meeting of the American Public Health Association.

Public Health—Product of Community Action

How Does a Community React to Its Health Needs?

EARL LOMON KOOS, Ph.D.

If one word could epitomize the reasoning running through this entire paper, that word would seem to be "perspective"—an attribute above price and one that public health leadership needs desperately to sharpen and refine.

✣ I believe that all of us need to keep in mind one of the closing sentences in Dr. Erickson's paper—"it is obvious that, given leadership, direct or 'submerged,' and when offered the opportunity to take active part in planning and carrying out the program, the people enthusiastically responded [by] providing good ideas, capable volunteer assistance, and the necessary finances for sound health services." Were these factors always present, my part in this program would be uncalled for. Were these factors always present, public health activities would be further advanced in all parts of our country than they are at present. But these are not always present—hence this paper.

Since no community has perfect public health facilities, and only a very few are thoroughly negligent of their public health responsibilities, it follows that any community's activities in the realm of public health may be plotted somewhere on a continuum with a number of polar opposites—adequate facilities as against inadequate, knowledge as against ignorance, public interest as against public indifference, adequate funds as against inadequate funds, etc. Also, the reaction of the community's members to its health needs lies somewhere between complete rejection and complete acceptance. This, then, is the answer to the question assigned me—community reaction to health needs is varied and variable, and in each case is to be found somewhere on a continuum between a perfect meeting of or a complete neglect of those needs.

Public health activities may be viewed, therefore, as efforts to move the individual's or group's attitudes and behavior further along on the continuum toward the positive end—to have more adequate facilities and finances, more knowledge, interest, and participation concerning health, etc. To indicate that a community reacts either positively or negatively is not enough. The real question facing the public health professions is not so much where the community is on this continuum as why it is where it is. Our concern must be with the factors which cause the community to react as it does.

At the risk of seeming to be discursive, I think we need again to remind ourselves that the term "community" is a very broad and inclusive one—that very often a community is made up of several subcommunities. Each of those parts of the total community has its own special characteristics which arise out of its racial, ethnic, social class, or

Dr. Koos is professor of social welfare, Florida State University, Tallahassee, Fla. This paper was presented before the First Special Session of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 10, 1953.

other differentiations. In many cases, these subcommunities can be seen in geographic isolation; in others, they are present only in terms of interaction (or its lack) which occurs in the community. We need to remind ourselves, also, that communities are not necessarily political units—that a true community may be only part of a political unit or may, in fact, comprise parts of two or more political jurisdictions.

A first, and I believe a most important factor may be stated in these words: A community reacts (positively or negatively) in terms of its own special concepts of health. We have recently been canvassing the literature in this field in an effort to secure certain definitions which will be acceptable and applicable in all cases. One of these is a definition for the term "health." It appears that there is no one meaning—that there are as many meanings as there are groups and individuals who use the term. We who have professional interests in public health have come to regard certain activities as minimal—we have come to have what we term "health standards." But these are ours and not necessarily those of the people who share in a community's life. The standards acceptable to the latter may, in fact, be quite different and subordinate to those held by health workers. A community may react, then, in one way to what it regards as the necessities for health, but in a quite different way to what the public health authority sees as a necessity. This is not to say that these two sets of standards should not be brought into agreement, but only to point out that a community reacts in a way characteristic to itself, and that this way of reacting is in terms of its own ideas about health.

Why a community—or, more important, a portion of a community—holds a particular attitude regarding health and illness is not always easy to indicate. Certainly, we know by now that each ethnic and racial group in the community has its special concerns and antagonisms regarding health. We know, too, that each of the several social classes—whatever they may be in a particular community—tends to hold special definitions of health and illness, and that these sometimes differ vastly from one class to another. Prescriptions and proscriptions regarding health, as held by any one community, are therefore the product of forces peculiar to that community—and must be recognized as such.

Second, a community reacts (positively or negatively) to its health needs in terms of its value system. (This is an area to which little significant attention has been given). This factor is akin to but not identical with the first, for it involves not criteria concerning health but rather where—in the whole range of human values—one shall place health. It does us little good, for example, to emphasize the value of early and frequent prenatal examination if the community in which we work places little emphasis (in its own value system) upon maternal health and the well-being of the newborn—if, in fact, that community regards maternal and infant deaths as being "God's will and not to be tampered with."

From our current researches it becomes increasingly evident that health is a value, but a value which is always in competition with other values. A new airport, a new park, or some other symbol of civic pride and righteousness may take precedence over needed health facilities. A new car, a television set, a genuine dyed-rabbit fur coat—all of these are symbols of values that may rank, in any one community for any one person—far above the value placed upon health (as you and I understand it). Even though we do not understand completely the mechanisms of their operation, we do recognize that these values have a truly compulsive power

in determining community or individual activities. It is evident, then, that the value system of a particular community or subcommunity must be known and its importance appreciated if we are to understand how that community reacts to its health needs.

Third, a community reacts positively or negatively to its health needs in terms of its level of communication and, therefore, as a result of its members' participation. It is surely not accidental that the well baby and preschool clinic described by Dr. Erickson failed the first time, for it is quite evident that there had been little communication between the public health personnel and the possible clientele of the clinic. There was communication, yes, but communication between the nurses and prominent "leaders" in the community. Leaders, of course, but leaders in terms of what? While we must admit the presence in any community of socially prominent people who are "interested" in public health, it is very often true that such persons are not identified as leaders by the persons who must be led. Unless the effective leadership of the "natural groups" in the community is determined, and then used, programs are doomed to at least partial failure. In an earlier article,* it was pointed out that public health activities can be effective in any group only if they occur in an atmosphere in which the members have high morale and the opportunity and encouragement to communicate on a democratic level. Communities have high morale in matters of health only to the degree that indigenous leadership is recognized and accepted by public health personnel, and only to the degree to which it arises out of a mutual recognition of human worth. While such leadership may not at first possess aspirations and values that match our own, it can usually be brought to share these. Such leadership constitutes, in effect, the fulcrum by means of which larger groups can be moved toward the more positive end of our continuum.

We cannot avoid the presence in the community of groups which are quite removed from each other in their social relationships, but unless we are cognizant of the social distances involved and of their meaning—and unless we do something to bridge these distances with adequate communication — we can hardly expect to have participation by all portions of the community. Also, we cannot expect to have high morale if one significant element of that community feels that it has no part in the decisions which affect it directly.

Fourth, a community reacts positively or negatively to its health needs in direct ratio to the realism of the planning for health. This must be viewed in two ways. One we have already referred to—realism as to what the community members view at a given time as their health needs. The other is in terms of the ability of the community to support health services. It is entirely natural that those of us who are interested in health should want the best for our communities, and should press to further our objectives. I, for example, would like to see more and better rural hospitals in my adopted state of Florida, for I feel that the health of our people is of prime importance. Others with interests centered in education will press with equal vigor for better schools in exactly the same communities in which I am urging better health facilities. But many of these communities are poor, some of them desperately poor—possibly because they are not located where they can get at the pocketbooks of tourists—and we have somehow to share our goals in proportion to what the community can realistically afford. To set goals which are disproportionate to other needs and disproportionate to

* Koos, Earl Lomon. New Concepts in Community Organization for Health. A.J.P.H. 43, 4:466-469 (Apr.), 1953.

the community's ability is only to provoke irritation and discouragement for all concerned.

The need for realism requires, too, that public health personnel act in close cooperation with the personnel of other institutions. Health (and its counterpart, illness) is only one part of man's life—whether viewed in terms of the individual or of groups of individuals (the community), and a part which he cannot separate from the other parts of his existence. It is unrealistic, then, to expect that he can understand and accept public health activities if they attempt to operate in an icy apartness from other activities concerned with his welfare. It is surely correct to say that the community's members react most favorably when health activities are thoroughly integrated with other activities directed toward meeting human needs.

Fifth, a community reacts positively or negatively to its health needs, in some measure, at least, in proportion to that community's providing private as well as public health agencies. It is probably correct to say that public health authorities are free to experiment to a degree permitted no other governmental group. Even so, it is also true that governmental agencies, by their very nature, are prevented from venturing into many areas in which experimentation is of prime importance in developing new philosophies and technics, in enlisting the enthusiasm of community members. The community which supports such private agencies, of whatever sort—if they are effective but not duplicating—is providing just that many contacts with health activities for the divergent groups that make up the community.

While a community's health is to a considerable extent a matter of sanitary engineering (and I have no intent of minimizing this aspect of public health activity), it is also—and in good measure—a matter of the individual's and family's own acceptance of health standards and procedures. Reaction to public health "yardsticks" and goals is positive or negative, then, in terms of (1) what health is conceived to be, (2) of how health goals are viewed as related to other goals, and (3) of how favorably members of the community react to each other, share a common thinking, and view their real differences democratically. All of these are centered in the members of the community themselves. On the other side, public health "yardsticks" and goals are accepted or rejected in direct proportion to (1) the realistism of the approach public health personnel make to the whole problem of what the community can afford, recognizing that formal health activities are only one part of the community's entire need, (2) the degree to which public health activities are integrated into the whole of the community's activities, and (3) the degree to which public health personnel recognize the value and need for "ancillary" health activities in the community.

Public Health—Product of Community Action

Setting Our Sights for the Future

JOHN D. PORTERFIELD, M.D., F.A.P.H.A.

A state health officer sifts the sociologic concepts offered in the preceding papers through the critical sieve of hard, practical administrative experience, and the ideas that survive the sifting commend themselves as doubly demanding of your attention.

✣ In his book, We Chose the Islands, Sir Arthur Grimble recounts his experience with native octopus fishing on a Pacific Island. To preserve the dignity of his office of administrator he was once forced to participate in this "sport." The procedure was simple enough. A team of two would find a coral reef where the beasts lived. One member of the team would dive down and offer himself as bait before an octopus cave. When he was well encircled by tentacles, his companion would dive down and pull him back from the cave entrance. The octopus would release his hold on his home rather than on his meal. The "bait" would then kick his way to the surface with the octopus. While the animal was preoccupied in seeking his victim's jugular vein with his beak, the team mate would surface alongside and drive a knife into a vital spot of the octopus. Apparently, this is a highly successful and much enjoyed outdoor sport in those areas. While one may, in passing, admire the very precise timing of this method and be impressed by this extreme expression of faith and interdependence on good teamwork, the primary reaction of most of us in this part of the world would be one of stark horror, not equaled since, if ever, by the nightmares of insecure childhood.

All of which is to say that it depends on the point of view. We have here at this meeting a play within a play. Each of the three preceding speakers was considering the problem of relating the point of view of the professional purveyor of community services to the point of view of the consumer—and purchaser—of these services. We have had the opportunity to consider, too, the contrast in point of view of the public health specialist and the social scientist.

The story which Dr. Erickson has told you is an absorbing one, but one which all of us will recognize in settings of our own and with many familiar scenes and passages. Members of the public health team have spent this last generation, at least, in being greatly preoccupied by the problem of developing good community health services. Some of us may have tried it by deciding in our own competence what was good for the patient and imposing the therapy by some form or other of force. But some of us, and more as the years went by, realized that community action offered a sounder, more stable mechanism, even before we thought of what we were do-

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ing by that term. It must be admitted that often the health officer is a working social scientist, albeit unconsciously. He may not be able to talk in the vernacular, but he does combine training in the scientific method with an awareness of and sympathy for people, their views, and the influences which shape their views. A health officer, particularly if he is native to the region in which he practices, can by long association with the tribal customs and community foibles do a good job of eliciting community action, playing by ear when he cannot read a sociologic note.

We must plead guilty in some degree to the major point made by Mr. Poston. In our preoccupation with public health we have contributed on many occasions to the fragmentation of the broad concept of community living. We did it for that matter even within the field of public health, not only by exclusive concentration at times on a special program in public health but by the insistence that only legally constituted official health agencies should have aught to say in the field of health. We have attempted to broaden ourselves in this and we talk now, and sometimes think, of the broad, integrated, balanced program of the health department and, even better, of the coordinated and cooperating community health program utilizing all community health resources.

Perhaps it is a little too soon to ask us to go on from there. The health officer is just now adjusting to the idea that he does not have exclusive monopoly as community health leader, that he must be a member of the community health team in which he should strive to earn the role of community health leader. At this delicate period of readjustment perhaps we could wait just a little while before we are asked to be submerged further in the total community approach. Admit that we are prejudiced in knowing well the benefits of a good community health program while being somewhat sketchily informed on the long-range advantages of some of the competing community interests that would be considered in this holistic concept. Admit, too, that we need yet a little while to attempt to improve our still intangible measuring devices which we need in order to make a convincing case for the health program. I am not pessimistic about the relative value placed on health in most communities, but I shall be more optimistic when we further refine the methods of demonstrating the qualitative and quantitative results of our services.

We can deal with Dr. Koos a little more confidently for he allows us to remain a little more within our own special interests. He sets up for us some guides to the factors on which are based the positive or negative reactions of communities to what we know so well is good for them. He reminds us, very kindly and only by implication, that specialists we may be, but specialists in the field of human relations and in community physiology we may not be.

We are asked by the implications of the previous speakers to consider the benefits to be derived from association with and consultation from the social scientist. I am one of those who believe that we have much to gain by this association and consultation. I am reminded of the physician at the 1952 Annual Meeting of the Association who remonstrated at the inclusion of a social scientist in a discussion of the relation—and the difference—between community wants and community needs. "But," said he, "what are you leaving for the physician to do?" It seems unnecessary to point out that, trained in the physiology, pathology, epidemiology, and immunology of the human being, the physician has a contribution which can never be overlooked in the public health program. But the special talents of the

social scientist will be of considerable value when we concern ourselves with the health of a community and how to assist in its achievement.

The way in which we avail ourselves of this special competence is, however, important in establishing the extent of its usefulness. The single intensive two-week long visitation of the social scientist to the community may or may not permit him to make a significant contribution to the health department's understanding of how and why certain community health programs succeed and others do not. But the frequent consultation with the social scientist, the periodic discussion with him of the psychology and rationale of community action may give the health officer some amazingly vivid insights into the problems he has in purveying services to a public which has a mind of its own.

It is almost an indispensable requirement that every good textbook on sociology contain in its introduction a warning that, while everyone thinks it is instinctive and congenital to understand sociology, it is truly a science which requires at least some preparation and training for its proper practice. Realizing, then, the dangers of venturing beyond my depth, I am still compelled to suggest several basic principles which it seems to me underlie what the social scientist is trying to help us understand:

1. Communications are of the first importance. Unless there is an exchange of understanding between those who offer and those who receive, there is at best poor provision of services. It is not enough to insure good channels alone. We have preoccupied ourselves with the stringing of the wires, but perhaps we have overlooked the careful identification of the terminals. Dr. Erickson's account of the unvisited well child conference is an apt case in point. The channels were engorged with announcements, the one terminal was easily defined—the conference room, personnel, and time—but the other terminal was only pointed to, directional radio beamings as it were, but not an established two-way contact.

More and more studies in human relations are demonstrating what we have long suspected—that the most conductive medium in a community is the back fence. At a time when our fiscal officers are becoming more querulous about vouchers for educational pamphlets, posters, and exhibits, it behooves us to become much more critically selective of our means of communication.

2. Of equal importance is that participation be two-way. Dr. Erickson illustrates the value of this principle when he reports that the development of actual participation by citizens—even as chauffeurs, clerks, and janitors—not only resulted in a successful conference but two years later caused the people to say in a budget crisis that they received more services from the health department than from any other county government agency.

You have heard the recent Eisenhower story of the African village. Some beneficent government agency had built a complete new village with sturdy, well planned housing and all the central facilities of a community. It stood empty, however, while the people for whom it was intended lived a mile or so away in their traditional squalor. The reason—the housewives refused to occupy quarters which provided individual water taps in each kitchen, for this deprived them of their major social activity, the town well. Citizen participation here would at least have saved unwise expenditure and might even have found a solution to the impasse.

3. With good communications and bilateral participation it is essential to develop a reasonably definite set of community goals, considering not only specific objectives but also a realistic

time schedule. This should be specific and definite, but at the same time flexible, so that citizens and professional specialists may take advantage of unanticipated gains and resources or may devote more time to difficult phases. All of us feel more comfortable with familiar landmarks. A plan, therefore, helps us all to be oriented. An added dividend could be hoped for in that a simple, well publicized plan might possibly end up as a back fence conversation piece, now and then, for Mr. Poston's great majority who belong to nothing except the community.

May I remind you of just two mechanisms which can work to implement these principles. The first is the lay self-survey. It provides a means of communications and bilateral participation and leads to the development of an acceptable plan. It is not scientific, perhaps, in the narrow epidemiological sense, but it provides a link between the professional knowledge of need and the expression of citizen want—a link which can in time bring need and want to be more closely synonomous.

The second mechanism which fits well into this pattern is the community health council. Here again, professional knowledge and lay interests have opportunity to combine forces. The professional specialist who cannot bring himself to compromise with lay interests may find himself a leader without a following and the parade may find itself wandering down the wrong streets.

I have probably demonstrated by example in these few sketchy remarks the health officer's need for consultation with the social scientist. Not to be hailed like a new antibiotic as a panacea for all our ills, the addition of the social scientist to the public health team is seriously to be considered as a very necessary augmentation of our resources. Or, as the social scientist might put it, we are awakening to the need for the health team to be consciously a participating member in the human relationship of the community.

Setting Our Sights for the Future is an ambitious title. Let me only suggest to you that as we listen and confer together we not forget our silent partner, the citizen of our community. As was said at the Governing Council meeting, it is an edifying practice to recollect that our tools may be facilities and clinics, organizations and structures, but our work is with people.

The Journal 25 Years Ago

An editorial on Noise in the March, 1929, Journal ends with this story to illustrate "that people vary tremendously in their reaction to stimuli of various sorts." "One must remember," says the writer, "the reply of the artillery officer at a concert who was asked if he liked music. His reply was, 'Yes, I like noise of any kind.' "

Phage Typing Antibiotic-Resistant Staphylococci

MATTHEW H. FUSILLO, LT. COLONEL RICHARD N. ROERIG, MSC, CAPTAIN JOSEPH F. METZGER, MC, AND COLONEL KENNETH F. ERNST, MC.

An intriguing speculation is suggested by the findings of this study. Are the antibiotic-resistant strains of organisms reported so frequently these days due solely to the failure of antibiotics, or their misuse? Or may our present difficulties be due, in part, to resistant forms that existed before the days of our "wonder" drugs, but were then masked by more aggressive but antibiotic-susceptible strains?

✣ Numerous editorials, reviews, and reports of experiments upon the resistance of staphylococci to antibiotics have appeared in the literature since the introduction of penicillin therapy.[1-3] The problems of multiple-antibiotic resistance of the staphylococci in a hospital population have been reported by many workers,[1-4] and recently in an editorial in a chemotherapeutic journal.[5]

In our laboratories, the number of penicillin-resistant Staphylococcus aureus organisms isolated from clinical material has fluctuated from 30 per cent in 1943 to 62 per cent in 1951. In 1952 there appears to have been a drop in resistant forms to 49 per cent. Accompanying this drop, was the increase from about 25 per cent to about 50 per cent resistant forms of these microorganisms to chlortetracycline * and oxytetracycline.[6] † The latter does not imply that a decrease in resistance to penicillin has been observed because of the increase in resistance to the broad-spectrum antibiotics. In the same period 6 and 9 per cent of the organisms tested were resistant to erythromycin and carbomycin.

In 1945 Wilson and Atkinson[7] described a method for identifying strains of S. aureus by bacteriophages. Few experiments had been conducted in this country using bacteriophage typing until a short time ago when Blair and Carr,[8] and Dowling, et. al.,[9] presented reports of the potential applicability of "phage typing" to problems involving the staphylococci. In Great Britain and Australia the technic has been applied to investigations of hospital cross-infections, food poisoning outbreaks, and other studies.[10, 11] Other than phage grouping of the penicillin-resistant staphylococci, this is one of the first reports known to us[10, 11, 14] to deal with the phage types of the antibiotic-resistant staphylococci other than penicillin alone. These antibiotics include penicillin, streptomycin, chloramphenicol, oxytetracycline, carbomycin, chlortetracycline, and erythromycin.

It is the purpose of this article to present the incidence of "phage patterns" of the antibiotic-resistant staphylococci encountered in a hospital population covering the period from August, 1952, to July, 1953, and to present the significance of these phage patterns in that community.

* The trademark of the Lederle Company for the antibiotic chlortetracycline is Aureomycin.

† The trademark for the Pfizer Company for oxytetracycline is Terramycin.

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This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 10, 1953.

Table 1—Phage Patterns of the Three Groups of Staphylococci (Modified After Williams and Rippon)

Group	Phages Characteristic of the Group	Common Phage Patterns
I	52; 52A; 29; 29A; 31; 31A; 44; 44A	52A; 52/52A; 29/52 29/31/44/52; 44/44A; 44A
II	3A; 3B; 3C; 51; 39; 55; 523.	523; 3A; 3C; 3B/3C; 3A/3B/ 3C/39
III	6; 7; 42B; 42D; 42E; 47; 47B; 47C; 53; 54; VA4; 70; 73; 75; 76; 77	6/47; 6/47/53; 7; 42B; VA4; 53; 47/53/75; 47/53/54/75; 42D VA4/53
Unclassified	42C; 47A; 142	7/42C/42E/52/52A/54/; 3A/44A 42C; 3A/7/54; 523/42B/44A/54/

Methods and Materials

The staphylococci included in this study were obtained by routine culture of various sources of clinical material. Organisms were isolated on trypticase soy blood agar plates and after identification were transferred to trypticase soy agar slants. They were then maintained at refrigerator temperature until used. In the case of the older cultures, subcultures were made about every six months. Sufficient organisms were included so that strains with multiple resistance were in the majority.

Sensitivity studies were conducted by either a tube dilution method previously described by Fusillo and Romansky,[12] or by a disc sensitivity method of Fusillo and Kuhns.[13]

Through the courtesy of Dr. John E. Blair, 34 staphylococcal bacteriophages were obtained from his laboratories for this study. Stock phages and phage typing procedures were accomplished by the methods described by Blair and Carr.[8] Petri plates, 105 millimeters in diameter, containing trypticase soy agar were streaked with a heavy, even inoculum of the organism to be tested. Each of the 34 phages was "spotted" within a preruled square on the plate and the plates allowed to dry. These were then incubated at 37° C. for six hours, after which they were refrigerated overnight. The plates were read the next morning for the plaques of lysis that occurred in any given square and the corresponding phage that had been "spotted" was recorded.

Of 485 staphylococci isolated during the past year, 372 (about 77 per cent) were typeable with the 34 available staphylococcal bacteriophages. The results are reported to conform with the "Phage Groups" listed in Table 1. This table is patterned after that of Williams and Rippon[10] and includes new phages from Blair and Carr,[8] as well as results of the current experiments. The microorganisms were categorized into phage groups and assayed with respect to the various antibiotic resistance patterns.

Results

Table 2 illustrates the percentages of all the staphylococci tested in these experiments which were resistant to the following antibiotics: penicillin, 74.5 per cent; streptomycin, 66.2 per cent; chlortetracycline, 66.9 per cent; chloramphenicol, 3.1 per cent; oxytetracycline, 66.9 per cent; erythromycin, 0.6 per cent; and carbomycin, 0.6 per cent.

Table 2—Susceptibility of the Staphylococci to Various Antibiotics (485 Strains)

Antibiotic	Per cent Resistant
Penicillin	74.5
Streptomycin	66.2
Chlortetracycline	66.9
Chloramphenicol	3.1
Oxytetracycline	66.9
Erythromycin	0.6
Carbomycin	0.6

In Table 3 the distribution of the staphylococci among the particular phage groups is listed. Most of the organisms typed (62.9 per cent) fell into broad phage Group III, with small numbers occurring in Groups I and II—7.6 and 2.5 per cent, respectively. Three and eight-tenths per cent of the organisms were not classified because a suitable phage group could not be established, and the remainder were not typed by any of the given phages.

The phage group frequency of 362 penicillin-resistant organisms is described in Table 4. The majority of the organisms again occur in phage Group III (74.5 per cent) with very small percentages in Groups I and II. Among the 123 strains of staphylococci that were sensitive to penicillin (Table 5), 35 per cent were in Group III, 13.8 per cent in Group I, and 9.8 per cent in Group II.

Table 3—Group Occurrence of Phage Typed Staphylococci (485 Strains)

Group	No. Typed	Per cent	Common Phage Patterns
I	37	7.6	44A; 44A/31; 31/52A; 52A
II	13	2.5	523; 3A/3B/3C; 3B/3C
III	305	62.9	7; 42B; 47C; 53; 7/53; VA4 VA4/53; 47/53; 47/53/75; 53/54; 47/53/54/75 *
Unclassified	18	3.8	42C; 3A/44; 3A/3B/44A 523/42B/44A/55/75
No lysis	112	23.2	

* May be joined by 6 and/or 7 and/or 73

Table 4—Phage Groups of Penicillin-Resistant Staphylococci (362 Strains)

Group	No. Typed	Per cent Typed
I	12	3.3
II	1	0.3
III	270	74.5
Unclassified	7	3.1
No lysis	72	18.8

Table 5—Phage Groups of Penicillin-Sensitive Staphylococci (123 Strains)

Group	No. Typed	Per cent Typed
I	17	13.8
II	12	9.8
III	43	35.0
Unclassified	10	8.1
No lysis	41	34.3

Table 6 shows that 73.1 per cent of the 321 organisms which were resistant to streptomycin were classed in phage Group III. Only one organism in Group II was resistant to streptomycin and 4 per cent of these resistant strains were classified in Group I. Of these 321 microorganisms, 318 were concur-

Table 6—Phage Groups of Streptomycin-Resistant Staphylococci (321 Strains)

Group	No. Typed	Per cent Typed
I	13	4.0
II	1	0.3
III	234	73.1
Unclassified	10	3.0
No lysis	63	19.6

318 of these were also resistant to oxytetracycline and chlortetracycline so that the figures would not be significantly altered for these antibiotics

rently resistant to chlortetracycline and oxytetracycline so that the distribution for these antibiotics would not be significantly altered. Staphylococci sensitive to streptomycin (164 strains, Table 7) indicated that 42 per cent were

Table 7—Phage Groups of Streptomycin-Sensitive Staphylococci (164 Strains)

Group	No. Typed	Per cent Typed
I	24	14.6
II	12	7.9
III	69	42.0
Unclassified	8	4.8
No lysis	51	32.7

members of Group III, 14.6 per cent members of Group I, and 7.9 per cent members of Group II. Again the distribution of organisms for oxytetracycline and chlortetracycline was essentially the same as for streptomycin.

Organisms (310 strains) with multiple resistance to penicillin, streptomycin, chlortetracycline, and oxytetracycline demonstrated a distribution similar to the previous findings for the respective antibiotics (Table 8). Seventy-three per cent of these organisms fell into Group III, 4.5 in Group I, and only one strain in Group II. Among the organisms sensitive to all the antibiotics used in the study (Table 9), the major portion fell into Group III (32.5 per cent). There was a significant number that appeared in Group I (17.5 per cent) and in Group II (9.7 per cent).

Table 8—Phage Groups of Organisms Resistant to Penicillin Oxytetracycline, Chlortetracycline, and Streptomycin (310 Strains)

Group	No. Typed	Per cent Typed
I	14	4.5
II	1	0.3
III	226	73.0
Unclassified	9	2.9
No lysis	60	19.3

Discussion

From the foregoing data it is quite obvious that the overwhelming majority of staphylococci isolated from clinical material in this hospital population occurred in phage Group III and a minority in Groups I and II. While this distribution appears to be skewed when compared with the data of Williams and Rippon,[10] there is some correlation with the data of Rountree [11] who recently reported that over 70 per cent of organisms from all sources occurred in phage Group III.

The homogeneity of the organisms used in this study cannot be overemphasized. The experiment was carefully controlled to reflect only organisms from the local environment. Among the organisms of Group III, the repeated occurrence of particular phage patterns 7; VA4; VA4/53; 47/53/73;

Table 9—Phage Groups of Staphylococci Sensitive to Seven Antibiotics (114 Strains)

Group	No. Typed	Per cent Typed
I	20	17.5
II	11	9.7
III	38	32.5
Unclassified	10	9.6
No lysis	35	30.7

47/53/75; 7/53; 53; 47/53/54/75 in infections throughout the hospital, without regard to source, leads one to speculate on the common heritage of these organisms. Over 48 per cent of the organisms tested occur in the previously mentioned phage patterns.

These phage typing experiments can be duplicated with very few cross-reactions when experiments are conducted with rigid controls. It would then appear conceivable that some of the research with regard to the increasing resistance of bacteria to antibiotics in hospitals has been masked by the existence of these resistant forms prior to the antibiotic era. The selected organisms were propagated in the natural environment of necrotic tissue, harbored and transmitted to other hosts, and thereby maintained themselves in apparent increasing proportions within the environs of the hospital. While it is realized that epidemiological reports would infer that the problem of antibiotic-resistant staphylococci is not acute outside the limits of the hospital, it nevertheless remains an endemic problem within the hospital. In our hospital alone the incidence of antibiotic-resistant staphylococcal infections has increased threefold in the past year. The mere fact that one applies an antibiotic dressing to a wound does not relieve him of the responsibility of employing the usual aseptic technic.

Barber and Whitehead,[4] as well as Rountree,[11] in Britain and Australia, respectively, have found in hospital cross-infection studies that organisms of Group III were more frequently implicated. Investigators have so far been unable to correlate various types of staphylococcal infections with any particular group of phages. It has been suggested that some of the nontypeable strains isolated from carriers may not be highly virulent. Then, when confronted with a relatively high percentage of typeable organisms associated with staphylococcal lesions, these organisms could be the "selected," highly virulent members of the species which have always existed.

Currently, there is controversy as to whether the antibiotics are the cause of the fatal postoperative staphylococcal diarrhea. Arguments against the antibiotics as being the etiological agent contend that the problem existed prior to the antibiotics—so did the organism. Resistance to the antibiotics is not confined to the staphylococci of Group III. There are also instances of resistance in Groups I and II. The incidence of resistance in the latter group, however, was of a very low order.

Blair [15] has demonstrated that there was no alteration in phage type when an organism was repeatedly exposed to penicillin in vitro. Unreported studies in this laboratory have disclosed similar findings with chlortetracycline. During these exposures the generic heritage of the organism remained the same as its predecessors. The modern scientist in his quest for objectivity is drawn away from the understanding that one merely rediscovers that which already exists. Resistance of bacteria to antibiotics is not new, but rather we have only fostered the selection and propagation of these forms in our large institutions.

Summary

1. Of 485 strains of staphylococci subjected to phage typing, 77 per cent typeable by one or more of the 34 phages available.

2. A majority of the organisms of this hospital population occurred in Group III (62.9 per cent) as compared with 7.6 per cent in Group I, and 2.5 per cent in Group II.

3. Organisms resistant to antibiotics can occur in all phage groups.

4. The high incidence of similar phage patterns would imply that one, or a few selected strains of staphylococci, is the progenitor of the staphylococcus-resistance problems within the confines of a large medical establishment.

ACKNOWLEDGMENT—The authors wish to acknowledge the valuable assistance rendered

by Jean Carrol in phases of these experiments; to the Statistics and Accounting Branch, WRAMC, for cataloging data on IBM cards; and to the Department of Bacteriology, WRAH, for cooperation in obtaining material.

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Motor Vehicle Accident Uniform Definitions

Uniform Definitions of Motor Vehicle Accidents in its second revision has just been issued by the Public Health Service. The manual is designed as a reference for assuring uniformity and comparability in classifying information from traffic accident reports, coroners' reports and death certificates, and in training traffic officers. The definitions were formulated by a committee whose chairman is Halbert L. Dunn, M.D., director of the National Office of Vital Statistics, for the National Conference on Uniform Traffic Accident Statistics. The conference is made up of representatives of 25 national organizations. The representative of the American Public Health Association is Jules V. Quint of the Metropolitan Life Insurance Company. The secretary of the conference is David M. Baldwin, National Safety Council, 425 N. Michigan Ave., Chicago 11, from whom the manual is available.

Observations Regarding the Presence of Psittacosis and Related Viruses in the Northwestern States

ROBERT K. GERLOFF and DAVID B. LACKMAN, Ph.D., F.A.P.H.A.

The other than pathologist reader of this paper will come away from it impressed first, with the scientific stamina of the researchers who venture into the study of virus diseases, and second, with the prodigious amount of painstaking work called for in each forward step in any rickettsial or viral research.

✠ An investigation into the presence of psittacosis and related viruses in the western states, particularly in the northern Rocky Mountain area, was initiated as an adjunct to extensive field studies on Q fever. The similarity in clinical symptoms between Q fever and psittacosis made it advisable to look for psittacosis among patients having a clinical diagnosis of Q fever but who failed to show Q fever antibodies in complement-fixation tests.

Attention was first directed to the occurrence of diseases of the psittacosis-lymphogranuloma group in human beings. It was later extended to include studies of the presence of these diseases in domestic animals. Interest in this latter phase was stimulated by recent reports of four new members of the group, two having been isolated from cattle and two from sheep.

In the first section of this paper, the results of serologic studies on human and animal sera are presented. Complement-fixation tests revealed that antibody to psittacosis virus was more prevalent in these sera than had been previously suspected. The second section of this paper considers the source of viruses which gave rise to this antibody. Special emphasis is placed on the new members of the psittacosis-lymphogranuloma group isolated from cattle, including two strains from cattle in western Montana.

Materials and Methods

The majority of the human sera tested by complement fixation were submitted by physicians throughout the western states. As a diagnostic service to them, the sera were tested with a variety of rickettsial and viral antigens, including psittacosis antigen. The remainder of the human sera were collected from groups representing specific occupations. All of the sheep and cattle sera were collected in the field from herds of animals. Upon arrival at the laboratory, sera were removed from the blood clots and either frozen or stored at 5° C. until they could be tested.

For the complement-fixation tests, antigens were prepared from either yolk sacs or allantoic fluid of embryonated eggs infected with one of these three strains: (1) the D383 strain of ornithosis virus isolated from a pigeon

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This paper was presented before the Laboratory Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 10, 1953.

in our laboratory, (2) the Gleason strain of psittacosis virus, or (3) the "L" strain of bovine encephalomyelitis virus isolated in 1949 by Dr. G. S. Harshfield at Brookings, S. D.[1] Two general methods of antigen preparation were employed. Either the elementary bodies of the respective virus were concentrated and purified by differential centrifugation or crude yolk-sac suspensions without purification were used. Heat treatment, either by boiling for 10 minutes or by exposing to live steam for 30 minutes, was applied universally to all antigens and, as reported previously by other workers,[2] was found capable of increasing the complement-fixing titer about eightfold.

In the complement-fixation test itself, the procedure proposed by Plotz[3] was employed, fixation being allowed to proceed for 18 hours at 4–6° C. Complement was standardized according to the method of Mayer and co-workers.[4] The unit of complement was defined as the amount necessary to produce 50 per cent hemolysis of sheep red blood cells. In each test, four units were employed. In all complement-fixation tests, care was used to prevent misinterpretations due to nonspecific reactions. Several known positive and negative control sera were included in each test. Whenever doubt remained, tests were repeated with several antigens of the same disease agent.

For isolation of ornithosis virus, a method described by Davis[5] was preferred. Mice were given a massive dose of the suspected tissue intraperitoneally. Seven days later, liver and spleen were passed to other mice intracerebrally. One blind passage of brain was made when necessary. This method of isolating the virus has been found to be highly sensitive, more so than either direct brain or nasal inoculation. It has the further advantage of permitting studies on contaminated material without the use of antibiotics for suppression of bacteria.

Experimental

Serologic Tests

As a result of complement-fixation tests on human sera received early in 1952, two cases of psittacosis were encountered in southern Idaho. They were among a group of individuals originally considered to have Q fever. Sera from both of these patients showed a titer of 1:128 against psittacosis antigen. The clinical history was likewise consistent with the diagnosis of psittacosis.

In the same year, another case of human psittacosis was encountered at Wenatchee, Wash. The illness occurred in a 70-year-old male. The source of infection was probably a parakeet which the man had owned until the recent death of the bird.

Following the discovery of these three cases of psittacosis in the northwestern states, psittacosis antigen was used routinely in the complement-fixation tests on all human sera submitted to our laboratory. One thousand nine hundred and fifteen specimens were examined for psittacosis antibody during the 18-month period ending in August, 1953. Thirty-one showed antibody titers of 1:16 or 1:32, five gave titers of 1:64, and 12 had titers greater than 1:64. In summary, 48 or 2.5 per cent of the 1,915 sera tested were positive for psittacosis antibody in a titer of 1:16 or greater. Seven of the individual patients from whom blood specimens were received probably had had psittacosis; this decision was based on the demonstration of an antibody rise, or on the fact that clinical and epidemiological history also strongly suggested psittacosis.

In two selected groups of human sera tested, the percentage of serologically positive specimens was somewhat

Table 1—Survey of Cattle and Sheep Sera for Antibody against Psittacosis Virus

Source of Sera	Number of Sera Tested	Per cent of Sera Showing Complement-fixation Titer in These Ranges:		
		1:8–1:16	1:24–1:64	Above 1:64
Cattle, western Montana	151	16	6	0
Cattle, southern California	302	30	18	3
Cattle, Idaho	53	40	17	2
Cattle, Kansas *	199	26	21	17
Cattle, Colorado	117	10	10	0
Sheep, Idaho	473	7	7	2

* Being studied for bovine encephalomyelitis

higher. Among 339 workers in turkey processing plants in Utah, 25 or 7.4 per cent showed psittacosis antibody titers of 1:16 or greater. In a group of 42 sera from sheepherders in Idaho, seven or 16.7 per cent were positive.

The majority of the cattle and sheep sera tested were collected in connection with Q fever and tularemia antibody surveys and not because there was clinical evidence of infection with a psittacosis-like virus in the herds. The results of complement-fixation tests on these sera, shown in Table 1, indicated that low to moderate levels of psittacosis antibody are also widely scattered among sheep and cattle. In a few individual animals antibody titers reached a presumably diagnostic level. The fact that of approximately 200 Kansas cattle being studied for bovine encephalomyelitis 17 per cent gave titers higher than 1:64 is of particular interest and substantiates the value of the complement-fixation test in reflecting the occurrence of this disease in cattle.

Isolation Studies

The discovery of this widespread distribution of antibodies against the psittacosis group logically raised the question concerning the nature of the stimuli giving rise to them. There is no reason to believe that all the sources of psittacosis-like viruses in nature have now been revealed. Indeed, it has been stated by two well known workers in this field, Drs. K. F. Meyer and B. Eddie,[6] that "Any laboratory worker who is willing to carry out a series of autopsies, and inoculate through blind passage in mice the spleen, liver, kidneys, and cloacal content of different birds or the lungs of mammals may in time discover previously unknown hosts of a psittacosis-like agent."

In our own investigations, isolation attempts are continually being made to extend the knowledge of reservoirs of these viruses. Two groups of pigeons were first studied. One of them comprised 20 birds collected in the Snake River Canyon near Twin Falls, Ida., where pigeons occur in large numbers. Six of the 20 birds were found serologically positive in complement-fixation tests. No strains were isolated, possibly due to conditions during shipment of the tissue specimens to the laboratory. The second group of 20 pigeons was collected in western Montana. Six of these were likewise serologically positive. These six, together with two that had been negative for antibody, were available for isolation studies. One of them, with a complement-fixation titer of 1:128, yielded a strain of ornithosis virus. Five years ago, three other

strains were isolated from pigeons in that area by other workers using similar methods.[7]

It is known that pheasants existing under the artificial environment of a pheasant farm can harbor and disseminate ornithosis virus.[8] Data on the occurrence of the virus in pheasants living in their natural habitat are almost completely lacking in the literature. In the current study, a survey was made of pheasants inhabiting the same area of western Montana where ornithosis virus is readily obtainable from pigeons. Liver, spleen, and cloacal contents of 103 pheasants were tested, but the virus was not obtained from any of them.

Explanation of the presence of psittacosis-group antibody in cattle must take into consideration the recently reported viruses of this group which occur in cattle. The disease, called bovine encephalomyelitis, has been studied extensively in cattle by Wenner and co-workers.[9] In our laboratory cooperative work with him on the etiological agent has shown conclusively that it cross-reacts completely with psittacosis virus in complement-fixation tests and is thus a member of the psittacosis-lymphogranuloma group. In 1951, York and Baker [10] characterized an apparently nonpathogenic agent which they had isolated from the intestinal tract of calves in New York State. It also was found to be antigenically related to psittacosis.

In our own investigations two strains similar to the York and Baker strain have been isolated from feces of calves in a western Montana herd, thereby furnishing evidence that this agent is probably also of widespread occurrence.

Whereas the white mouse has for years been the laboratory animal universally used for making isolations of viruses in the psittacosis group, it should be understood by the laboratory worker that the mouse is of little value in isolating the two agents from cattle. They produce little or no response in mice following any route of inoculation but readily infect guinea pigs by the intraperitoneal route.

The clinical and gross pathological picture observed in guinea pigs infected with the "L" strain of bovine encephalomyelitis virus may be described as follows: Following inoculation of infected yolk sac, there was a sharp, febrile response beginning on the first day. When infected animal tissue was used, the febrile response was always delayed until the second or third day after inoculation, usually the third. The earlier response to yolk-sac inoculum was perhaps due to a toxin produced in embryonated eggs but not in animal tissues. With either inoculum, illness in guinea pigs was always prolonged, with 10–12 days of continuous fever being common. Emaciation and weight loss were extreme, but no other marked external symptoms were apparent. Death, when it occurred, usually took place shortly after the fever subsided, on an average of about 14 days after inoculation.

Necropsy revealed a variety of gross pathological changes centered predominantly in the abdominal cavity. Most noticeable was the large amount of fibrinous exudate which coated the liver and spleen and sometimes extended to also cover the stomach and omentum. This exudate persisted for at least 20 days after inoculation. During this interval, the spleen remained normal in size or became only slightly enlarged. Small amounts of fluid were present in both the peritoneal and pleural cavities.

The clinical and pathological picture in guinea pigs infected with any of the calf-intestinal strains studied thus far was similar to that produced by bovine encephalomyelitis virus. Experience to date would, however, indicate that the intestinal strains are less virulent for guinea pigs since illness was always less severe and deaths did not occur.

Discussion and Summary

Evidence has been presented that antibody to viruses of the psittacosis-lymphogranuloma group is frequently encountered in complement-fixation tests on human, cattle, and sheep sera collected in the northwestern states. Lymphogranuloma venereum is practically nonexistent in this area; similarly, the presence of antibody to these viruses is only occasionally explained by a recent illness suggestive of psittacosis. Whether it results from subclinical infections with some member of this group or from constant exposure to a virus present in the environment but not capable of producing illness is not known.

The existence of at least two natural reservoirs in the area for the dissemination of psittacosis-like viruses has been demonstrated by the isolation of ornithosis virus from pigeons in western Montana and by isolation of a related virus from the intestinal tract of calves in the same region.

ACKNOWLEDGMENT—The authors gratefully acknowledge the assistance of Dr. Karl R. Reinhard in isolating the two strains of virus from the intestinal tract of calves.

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Kenfield Lip Reading Scholarship

Competition for the Kenfield Memorial Scholarship, awarded annually by the American Hearing Society to a prospective teacher of lip reading, opened on March 1. Winner of the award is entitled to take a teacher training course in lip reading from any school or university in the United States acceptable to the Teachers Committee. Graduation from college with a major in education, psychology and/or speech is a requirement. An applicant should have a pleasing personality, legible lips, good speech and voice, and no unpleasant mannerisms.

Applications, for which the deadline is May 1, are to be sent to the chairman of the society's Teachers Committee, Eleanor C. Ronnei, New York League for the Hard of Hearing, 480 Lexington Ave., New York 17, N. Y.

Use of Antibiotics and Antibiotic Residues in Research Animal Stock Diets

CHARLES A. SLANETZ, Ph.D.

A cautionary note addressed to those laboratories that raise or maintain their stock of experimental animals.

✣ The use of laboratory animal stock diets containing antibiotics or antibiotic residues introduces one more variable in a given experimental pattern. Whether the advantages of including antibiotics in such stock diets outweigh the disadvantages will depend largely upon the experimental procedure involved and on the judgment of the investigator. Caution should be exercised in making such a decision, since the response of different species of laboratory animals to antibiotics varies greatly, particularly when they are fed over a long period of time. Of the four laboratory animals under discussion—mice, rats, guinea pigs, and rabbits—the rabbit has perhaps received most attention in regard to its response to antibiotics. Templeton [1] has reported extensive observations on the use of antibiotic residues, aureomycin supplements, in a particular stock diet. His findings can profitably be reviewed in the light of more recent work.

Our observations on the role of antibiotics and antibiotic supplements in rabbit stock diets are concerned chiefly with their influence on reproduction, rate of growth, maturity, morbidity, and mortality. The diets used in our study include a well known commercially pelleted rabbit ration with added antibiotics, one without antibiotics, and also similar rations in mash form prepared in our laboratory. Adult does (Chinchilla rabbits) were mated, placed on the respective diets, and the litters produced raised to maturity. Weekly weights were taken. Morbidity and mortality records were kept on the rabbits fed the two types of diet.

No significant differences were noticed in the incidence of snuffles and intestinal disturbances among the two groups. A definite effect on excretion of coccidia oocysts was noted in the groups receiving antibiotic supplement —aureomycin T. F. 5, at a level of one-fourth of 1 per cent in the diet—the trend being toward the excretion of fewer oocysts or their disappearance from the feces. Although our experiments did not yield conclusive evidence that the infestation was eliminated in any individual animal, the results justify continuing observations on several generations of rabbits fed diets with and without added antibiotics.

Our study of the effect of antibiotics on sexual maturity in the rabbit has not yielded definite results, but some influence was noticed on rabbits used for the pregnancy test. There also is evidence that the positive tests are more striking in the rabbits receiving antibiotic residues than in the controls. We have made comparisons on so-called equivocal, negative and positive urine samples, using rats as well as rabbits for the pregnancy test. The data to date are on 90 samples suggestive of irregularities, but we feel that no definite statement can be made attributing the differences to antibiotic residues.

More work will have to be done both with the antibiotic supplements and antibiotics as such.

No appreciable effect on rate of growth in the rabbits fed the antibiotic-containing rations could be detected over a period of four months from birth. (This is in agreement with Templeton's report.) In fact, in some of our comparisons on two commercially pelleted diets we have obtained superior weight gains with rations containing no added antibiotic. This further confirms the thought expressed by some workers that antibiotic residues are not a substitute for good quality protein in a ration containing protein of low availability. These two commercial rations had the same crude protein level listed, but in one the protein was higher in quality.

In regard to incidence of intestinal disturbances some workers [1] have reported a marked decrease in antibiotic-fed rabbits with a concomitant decrease in mortality. Under our conditions of experiment, and in our selected stock-diet comparisons, we have found no significant difference in morbidity or mortality. It is obvious that for microbiological studies rabbits should be maintained preferably on stock diets containing no added antibiotic. Difficulty in producing spirochete lesions in rabbits fed antibiotic-containing diet has been experienced by workers in our laboratory, whereas, animals fed a commercially pelleted rabbit ration with no added antibiotics proved satisfactory for spirochete studies.

Controlled studies on guinea pigs fed antibiotic residues in natural food stock diets indicate that weight gain is slower at first than for those on control diet and marked loss of weight usually occurs after three months. The Chi square value of 7.4 obtained for the results of our last experiment is highly significant. The level of antibiotic residue fed was one-fourth of 1 per cent. Other workers [2] have found toxic manifestations in guinea pigs fed commercially pelleted diets containing antibiotics. High mortality was experienced during late pregnancy and shortly after parturition; hence, the question of using such stock diets for guinea pigs should be considered carefully when experiments involving stress are contemplated.

Perhaps the most consistent response that has been demonstrated in animals fed stock diets plus antibiotics has been in the field of antibody production. It has been shown in our laboratory that rats and mice fed antibiotics in stock diets over short periods of time yielded higher agglutinin titers for Salmonella antigens than those fed the control diet. The rats and mice were injected with phenolized Salmonella enteritidis antigen. Since the results [3] on chlortetracycline, oxytetracycline, and chloramphenicol had been published, further work has been done with bacitracin and streptomycin, and our results with these two antibiotics are in agreement with the earlier studies. With prolonged feeding of antibiotics and antibiotic residues an adverse effect on antibody production takes place. We have tried to counteract this interference of antibody production by incorporating such items as thiamine, yeast, and granulestin in the stock diets. There is some indication that these factors are helpful if the antibiotics are fed for not more than two weeks. The results on antibody production in rats have been found to be similar in mice and other species of laboratory animals. Gerstein of Southern Illinois University,[4] conducting immunogenetic research in poultry found that chickens maintained on a

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feed containing bacitracin failed to give the characteristic antibody response; whereas, he found that chickens fed a normal diet gave the usual good antigen-antibody results.

Work is in progress in our laboratory on the influence of antibiotics and antibiotic residues on pregnancy tests in rats. Our procedure comprises the use of immature female rats weighing approximately 50 gm., 22 days old, fed the following diets: a commercially pelleted rat diet without antibiotics, a commercial diet with added antibiotic residues, a laboratory mash diet with antibiotics, and the same diet free of added antibiotic residues. Sufficient data have not yet been accumulated to give an answer to the question as to what influence antibiotics and their residues have on the pregnancy test.

Certain routine protein bioassay methods now specify the inclusion of antibiotic residues, since it has been found that some natural food stock diets tested at a 6 per cent crude protein level give in the presence of antibiotics weight gains equivalent to a 12 per cent protein level. This was found to be the case in diets containing soybean meals. In mice it was found that streptomycin incorporated in a stock diet at a level of 200 mg. per kg. of diet favorably influenced weight gains in second litters compared to second litters on the control diet.

Studies on commercially pelleted rations fed to mice and rats have been made in our laboratory covering five generations of each species. No significant difference was found in reproduction performance between those on diets containing antibiotic supplements and those without added antibiotic. The same was true of rate of growth in these two species. Since our studies represent work on only three antibiotic residues, it seems desirable to extend this study to other antibiotics and also to observe the effect of different levels of antibiotics in stock diets.

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USPHS Medical Officers Examination

The U. S. Public Health Service announces an examination for medical officers in the Regular Corps of the Service for appointments in two grades, Assistant and Senior Assistant Surgeon. Entrance annual salaries for officers with dependents are, respectively, $6,017 and $6,918. Positions are open in clinical medicine, research, and public health.

Applications must be completed by April 30, 1954. Application forms and further information from Chief, Division of Personnel, Public Health Service; Washington 25, D. C.

Dental Public Health Accomplishments and Predictions

JOHN W. KNUTSON, D.D.S., Dr.P.H., F.A.P.H.A.

In his introductory remarks, the speaker at the Dental Health Section's tenth anniversary luncheon said: "I look back over the past 10 years and conclude that more has been accomplished in dental public health during the decade than during the previous 50 years." He makes his point handily. His prediction of things to come in dental health will prove a challenge to other health workers to match the continuing progress he foresees.

✣ Back in the year 1943 we knew a great deal about the dental health of our people. Of the first two million men examined for induction into the armed services, more were rejected because of failure to meet dental qualifications than because of any other physical defect.[1] About one out of every 12 men examined was rejected because of dental defects. At that time we knew that the nation's children were receiving less than one-fourth of the dental services they required and that treatment needs were accumulating about five times as fast as they were being cared for.[2] We knew there were not nearly enough dentists to serve the population adequately and that our dental schools were unable to do much more than keep pace with the normal turnover caused by death and retirement. The situation was further aggravated by the demands made upon the profession by the armed services. In World War II more than a fourth of our dentists were called to serve their country in the armed forces.[3]

You will remember that in an attempt to alleviate the serious problem of inadequate dental care for the civilian population, the dental schools inaugurated speed-up or accelerated programs.[4] Students attended school throughout the summer months, thus enabling them to finish in three instead of in four years. The maldistribution of dentists became so serious that the federal government launched a dentist and physician relocation program in which the Surgeon General of the Public Health Service was authorized to enter into an agreement with a dentist or physician so that he would practice his profession in a critical area.[5] Certain incentives were provided to encourage dentists to move into such areas. As in every other profession, the war years were emergency years.

The foregoing gives the dimensions of the problem in very broad terms. The generalities in the description in themselves lead me to a discussion of the first accomplishment—a fundamental and necessary precursor to the many other milestones recognizable during the past 10 years. One of the outstanding achievements of our section's short existence was the development of criteria for measuring the size and nature of the dental caries problem in quantitative terms. It is true that the DMF concept for the measurement of dental caries was developed a few years

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before in the Hagerstown studies.[2] But the decade beginning in 1943 saw the real application of this yardstick. That decade saw the refinement of methods for determining the prevalence and incidence of dental caries, for measuring the impact of dental caries on tooth mortality, and for determining accurately the ratio of filled teeth to carious teeth. Here, then, for the first time was a tool we could use for measuring the size of the dental caries problem in a community, for epidemiological studies, and for clinical tests of preventive and control procedures. With it we could determine the progress or lack of progress made with a specific program. Without it we could not effectively and confidently move toward our objectives.

At the beginning of the decade we did not have a single practical method for preventing dental caries on a public health basis. To be sure, we had an abundance of evidence of high correlation between the consumption of refined sugars and the prevalence of dental caries.[6] However, the practicability of a preventive program based on reduced sugar consumption had not been demonstrated. Our dental programs were confined largely to the early detection of new carious lesions and the prompt filling of carious teeth.

Detailed knowledge of the characteristics of the disease suggested programs designed to care for the dental needs of children on an incremental basis rather than those which were attempting to deal with the consequences of postponed care. Such dental care programs would minimize needs arising from neglect and would avoid the totally unmanageable problem posed by the accumulation of dental defects over many years. This practical approach to the dental care problem is as sound today as it was then. However, the need for emphasizing care rather than prevention made those early years in dental public health trying, indeed. Because they provided direct dental care, it was difficult to win acceptance of those programs. Public health administrators and dentists were overwhelmed by the size of the problem and the projected costs of a program designed to meet it.

No wonder those of us who lived through the days of the early, limited substance programs appreciate present caries preventive measures which can be applied so effectively and economically on a public health basis. I need not dwell here on the details of the development of topically applied fluorides and water fluoridation as specific methods for the partial prevention of dental caries. All of us have been required to orient and reorient ourselves in the background and evidence which supports the case for the use of fluorides. By adding fluoride to the water supplies of several thousand communities, nature had provided us with a wonderful laboratory for studying the effects of fluorides on dental caries experience. But it remained for McKay,[7] Dean and associates,[8] Klein,[9] and Bull [10]—to name only a few in this country—to apply the methods of epidemiology and provide us with conclusive evidence that a concentration of approximately 1.0 part per million of fluoride in the drinking water supply effects a two-thirds reduction in the incidence of dental caries.

Next came the studies on controlled water fluoridation. We needed the evidence and the experience gained from these before we could recommend that dental caries be controlled by adjusting the fluoride content of water supplies. Several such studies were started, three of them in 1945.[11-13]

The endorsement of this procedure by virtually all national organizations concerned with dental health came in rapid succession five years after the first studies of controlled fluoridation got under way—among them, the American Dental Association, the State and Territorial Dental Health Directors, the

American Association of Public Health Dentists, the State and Territorial Health Officers, the American Public Health Association, the National Research Council, the Public Health Service, the American Medical Association, and state health department after state health department. As you know, almost 16,000,000 people in more than 800 communities are now drinking fluoridated water.

This review of one of the most remarkable preventive measures developed during the past quarter century would be far too superficial if it overlooked the contributions made by the laboratory investigators, McClure, Armstrong, Cox, Heyroth, Largent, and Hodge, among a host of others. In large measure their work assured us that we were meeting the first requirement of any public health procedure, namely, that it must be safe. No less should we overlook the contribution of the water chemists and water engineers who gave of their time and competence in refining procedures for maintaining proper fluoride concentrations.

As you know, additional studies, both in this and in other countries, have confirmed the finding that a 2 per cent solution of sodium fluoride applied to the enamel surfaces of the teeth reduces the incidence of dental caries in children by 40 per cent. Confirmation of the finding led to an appropriation of $1,000,000 for a nation-wide demonstration program designed to bring about rapid and widespread use of this preventive measure.[14] Topical fluoride demonstration teams, each consisting of a dentist, two hygienists, and a clerk, were assigned to states at the health department's request. Operating under the direct supervision of state dental directors, these teams demonstrated how the benefits of topical fluoride applications might be brought to school children on a community-wide basis. As a demonstration program, it was temporary and, after operating on an annually decreasing budget, was finally terminated last year.

The success of the program is difficult to measure at this time. However, approximately 1,150 communities, mostly rural, now have dental programs which include topical fluoride applications. The effectiveness of the method has been confirmed and reconfirmed. It is the only fluoride preventive measure available to children in areas without public water supplies. Some communities, realizing that only children who drink fluoridated water from birth obtain the full benefits of fluoridation, have topical fluoride programs in addition to adding fluoride to their water supplies. This unique approach enables them to protect the teeth of older children until fluoridation has been continued over a long enough time to bring its full benefits to the entire child population.

Another accomplishment of paramount importance during the past decade was the establishment in 1948 of the National Institute of Dental Research within the framework of the Public Health Service.[15] It is obviously impossible to evaluate the contributions the institute has made to the improvement of the dental health of our people within the short span of its existence. The law providing for its establishment marked the formal recognition by the Government of the United States of the seriousness and importance of the nation's dental health problems. Not only did the Dental Research Act provide for intramural research within the Public Health Service, but it provided for research grants and fellowship programs, seeking to encourage the conduct of dental research by qualified institutions and to provide for the training of graduate students in order to prepare them for research work and thus strengthen the nation's potential for future dental research.

Another program of far-reaching importance was launched during the last decade—a program for the early detection of oral cancer. At a joint meeting of the National Cancer Institute and the Council on Dental Education of the American Dental Association in 1947, it was decided to help prepare dentists for this job of detecting oral cancer in its early stages. The National Cancer Institute undertook a program of grants-in-aid to dental schools for the improvement of cancer teaching.[16] Approved dental schools were eligible to receive up to $5,000 annually. At present, 40 of the 42 dental schools are participating in the program. The oral cancer program has made it possible for dentists and dental students to obtain training in the early recognition of oral cancer, has stimulated a number of clinical and fundamental oral cancer studies, and has offered the dentist another opportunity for real public service.

I have mentioned topical fluorides, water fluoridation, the National Institute of Dental Research, and the oral cancer program as dental public health highlights of the last decade. However, at the outset, I emphasized the basic importance of the development of criteria for the quantitative measurement of dental caries. In the same category I would place the organization and effective staffing of dental units in state health departments.

In 1941, 27 state health departments had separate dental organizational units. Ten years later, dental units were maintained by health departments in 46 states, the District of Columbia, and three territories. The large majority of the dentists in these organizations have had formal training in public health disciplines. Unfortunately, most of the dental units have skeletal staffs, and the problem of recruitment of qualified personnel has loomed large under the haze of low salaries, questionable administrative status, and woefully inadequate funds. Yet, despite these limitations, dental units have grown in stature. Had they not grown, had they not kept alive to the ever-increasing responsibilities imposed by new developments, most of the progress during the last decade would have been impossible.

The increasing responsibilities and abilities needed in dental public health administration have resulted in better training and improved standards for public health dentists, standards that were set forth by a committee of this Association.[17] Establishment of the American Board of Dental Public Health, fostered by the American Dental Association and the American Public Health Association, also aided in improving the standards and training of public health dentists and marks another milestone in the growth pattern of dental public health.[18]

During the decade organized opportunities for public health dentists to get together and exchange views and experiences met with outstanding success. First, in the last decade was the organization of the Dental Health Section of the American Public Health Association. This was preceded by the organization of the American Association of Public Health Dentists.[19] Then came the Conference of State Dental Directors with the Surgeon General of the Public Health Service and the chief of the Children's Bureau.[20] Directly related to this meeting was the establishment of an organization for state and territorial dental directors. Other meetings of prime importance to dental public health workers originated with the organization of the Dental Health Section of the American Dental Association and the annual conference with its Council on Dental Health.

With the establishment of this council, organized dentistry gave formal recognition of the fact that it had a stake in the public health. You are

all aware of the council's efforts to familiarize dentists with the objectives and purposes of community dental health programs, the principles upon which they are organized, dental program content, and the need for active community participation on an informed basis.[21] Dentists working independently, as well as through their local societies, state associations, and the national organization, have made important contributions to the improvement of dental health by their interest in and support of community, state, and national dental health programs. The activities of the council in focusing the attention of the dental profession on health problems have been an integral factor in our progress.

Next, I would like to call your attention to the orthodontic program for indigent children in New York State.[22] The development of this program represents an outstanding example of assistance from orthodontists and their cooperation with the State Health Department. The program attempts to screen and treat those indigent cases which, without orthodontic services, would undoubtedly lead to disfiguring malocclusion and serious emotional problems. This program has gained the attention of all public health workers concerned with the health hazards inherent in untreated malocclusion.

Another star achievement was the development of the team approach to the treatment and rehabilitation of cleft lip and cleft palate cases. The team, consisting of the dentist, the pediatrician, the oral surgeon, the orthodontist, the prosthodontist, the speech therapist, and the psychologist, combines talents and competencies for the diagnosis, treatment, design of prosthetic appliances and the rehabilitation of cleft lip and cleft palate cases. Typical of the centers using this approach is the splendid and well known work of the Lancaster Cleft Palate Clinic in Pennsylvania.[23]

Included in our list of accomplishments for the decade is the completion of the Woonsocket, R. I.,[24] and Richmond, Ind.,[25] dental care study programs. These projects were designed to determine the dental care needs of school children on an annual increment basis. The results demonstrated that care provided on an annual basis requires about a fourth the service time necessary for meeting accumulated needs, such as those found at the beginning of the study. An extra dividend of this study was data and experience on the effective utilization of dental assistants. It was found that a dentist can double his output with the help of one full-time and one half-time assistant. In addition, the dentist who uses assistants effectively can give better service at less cost, and with less fatigue. The study showed, too, that once the children are on a maintenance level, one dentist with the help of trained chairside assistants can render service to approximately 1,300 children annually.[26]

Another accomplishment has been the recent progress made in the development of a simplified method for classifying malocclusion. Although it is too early to evaluate this technic, it is certainly obvious that the orthometer which was developed by Elsasser is a step toward standardizing the classification of dentofacial deformities.[27] Similarly, productive effort has been directed toward the development of more simplified measurements of periodontal conditions. The PMA and similar indexes have brought us beyond the stage of an intelligent consciousness of the need for criteria of this kind to a working measurement for experimental use in defining the epidemiological characteristics of these conditions.[28]

Our list of examples of accomplishments also includes: the Michigan program for promoting the use of topical fluorides, a summer program based on the employment of dental hygiene and

dental students and their assignment to communities to provide topical fluoride services on a minimal fee basis [29]; the Tennessee Dental Seminars which were designed to bring and are bringing continuing professional education to dentists on a regional seminar basis [30]; and the Askov, Minn., dental care project which demonstrated that dental care services can be brought to a town without a dentist by an organized effort to draw on the dental manpower resources of surrounding communities.[31] It also includes: the State Dental Health Workshops, sponsored by the Council on Dental Health of the American Dental Association, state health departments, and state dental societies and conducted for the specific purpose of examining the dental problems of a state, the resources, the facilities, and the methods which might be employed to solve those problems [32]; the establishment of principles for dental care prepayment plans by the Council on Dental Health of the American Dental Association [33]; and the dental schools survey conducted jointly by the Public Health Service and the Council on Dental Education of the American Dental Association which analyzed the distressing financial, physical facility and teaching staff shortages of our dental schools.[34] Among these are several accomplishments which demonstrate an increasing acceptance of the so-called problem-solving approach. The first step in that approach cannot be taken without a willingness to expose the problem to a critical examination of its dimensions, its characteristics, its nature, and even its relatives.

It is clear that none but the most expert among crystal ball gazers could, at this close range, do justice to an evaluation of the rapidly moving developments in dental public health. I should not be surprised if the mere beginnings of developments referred to in this presentation, or one or more which have not even been mentioned, should turn out to be the star of them all. So it is with a feeling of inadequacy to judge our immediate past that I venture into the last phase of this presentation—predictions for the future.

The nature of accomplishments during the past 10 years made this a decade of beginning in the field of dental public health. Water fluoridation, topical fluorides, oral cancer detection and control programs, the team approach to the diagnosis and treatment of cleft lip and cleft palate cases, orthodontic care programs, utilization of chairside assistants, the National Institute of Dental Research, approaches to the epidemiology of dento-facial deformities and periodontal diseases, and principles of prepayment for dental care services—all these are no better than well begun and several are in the budding stage. The objectives of all and the merits of most of them have been firmly established and are not in need of words of justification from me. Furthermore, if they are sound beginnings, then a mere glance in the direction of the crystal ball warrants the prediction that they will increase in scope and coverage during the years ahead. Only the pace is uncertain and subject to the whims of our will and effort and our success in improving the effectiveness of that effort.

Effort in the form of dental research mothered the substance of today's dental public health programs. Therefore, it seems safe to predict that the manner in which dental research is nurtured and supported will determine in a large measure our progress in the future. I referred to the establishment of the National Institute of Dental Research with its research grants and fellowship features as a major accomplishment. Nevertheless. I was referring to something which is still largely in the conceptual stage. This country is spending more than a billion dollars annually — about one-eighth of our

health dollar — for grossly insufficient, inadequate, and incomplete dental care services. Yet, less than 1 per cent of our health sciences research money is being expended for dental research. Furthermore, less than one-tenth of 1 per cent of the amount we are expending for dental care is being plowed back into research to help resolve our problems through preventive rather than treatment methods.[35] Expansion of our future research potential through fellowship programs and increased funds for research and research facilities is a great unmet need. Therefore, I predict or express the fervent hope that all of us will be spending far more effort than we have in the past to bring about a change in this status.

Since prediction and hope have now been commingled, I should like to refer to the most obvious yet most elusive stars in the firmament of the future—principles of public health administration, health program promotion, and health education. I am referring, of course, to our basic lack of knowledge of the forces which motivate people to action in relation to health matters or which fosters doubt, indifference, procrastination, and even violent opposition based on bizarre combinations of information and misinformation. The striking similarity in frustrating experiences in the promotion of water chlorination, beginning with this century, and today's program of water fluoridation should point up the long overdue need for basic sociological and psychological studies in this area. Small beginnings have been made here, too, as exemplified by the effort to analyze the reasons for the success or failure of the topical fluoride demonstrations—an analysis which was reported at last year's annual meeting of this Association.[36] I can think of nothing that has greater potentialities of improving our effectiveness as health program administrators than has a full investigation of this intriguing area of unknowns so that we may begin to operate on the basis of established principles rather than round-word combinations or glib catch phrases such as "forward planning," "group dynamics," "shared thinking," and "ongoing activities."

Finally, I predict that our struggle for status in the administrative hierarchy of health departments and agencies will continue. This is a problem which, like the poor, will always be with us. However, I predict that we will create and seize our opportunities, better than we have in the past, to justify status on the basis of performance as well as privilege. I use privilege here in its highest sense. In the future, as is so evident from the past, it will continue to be a great privilege to serve with our coworkers in health departments and health agencies. The problems, the challenges, the opportunities for satisfaction in achievement and accomplishment, yes, even the opportunities for frustration will continue to be far greater than in any other field of endeavor. What more can a man ask!

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A $15,000,000 Grant for Medical Education

The University of Pittsburgh has received three identical grants of five million dollars, chiefly to enable the School of Medicine "to strengthen and extend" its program of developing a permanent faculty. These grants will make it possible to put into action the broad innovations in medical teaching proposed by Robert A. Moore, M.D., recently appointed as vice chancellor in charge of the schools of the health professions. Among the plans is a new health center to be connected with Presbyterian Hospital by a clinical wing.

The three foundations making the grants are the A. W. Mellon Educational and Charitable Trust, the Richard King Mellon Foundation, and the Sarah Mellon Scaife Foundation.

Public Health Aspects of Waste Disposal by Composting

CLARENCE G. GOLUEKE, Ph.D., and HAROLD B. GOTAAS, Sc.D., F.A.P.H.A.

Reported here is a satisfactory method for composting municipal garbage to produce economically a fertilizer that benefits the soil and is safe for market crops. As we seem to possess no other way of garbage disposal that entirely fills the bill, this proposal merits especial interest by all municipal officials.

✢ The need for a practical method for refuse disposal relatively free from inherent public health hazards and yet capable of keeping pace with the economic and other problems engendered by a rapidly growing urban population is becoming increasingly urgent in the United States. Composting these organic wastes and using them for soil conditioners and fertilizers represents such a possibility.

The mounting problems of refuse disposal are becoming of increasing concern to public health and municipal officials, as well as to the public generally. The extensive growth of many cities and fringe area development around cities have reduced the sites available for land fill disposal. Some cities will soon have no disposal site available within a reasonable hauling distance. Amounts of refuse on a per capita basis also have been increasing. Important sanitary problems exist in every method of refuse disposal now in use. Especially serious are open dumps where flies—flourishing on exposed garbage and breeding countless new generations—are paralleled in numbers only by a well fed rodent population. Empty tin cans offer breeding places for various mosquitoes, among which are disease vectors such as Culex tarsalis, responsible for the spread of encephalitis. Odor problems from anaerobic decomposition, as well as smoke and other atmospheric pollutants from burning, usually accompany the operation of such dumps.

The ordinary land fill in which the "working face" is left uncovered and on which open burning is practiced represents but a slight advance beyond the open dump. Even in the sanitary land fill, which is one of the best current approaches to refuse disposal, there are significant problems in controlling odors, flies, and insects on these fills. Studies [1] of the fly population at 13 sanitary land fill disposal sites in California indicated that fly control measures were continually necessary and flies would quickly reach nuisance numbers if not rigidly controlled. Furthermore, if the fill was not properly compacted and covered, large crevices formed in which rodents found a shelter and a breeding place. Fires also were a problem and a hazard.

Incineration has often been considered the most modern method of refuse disposal, since the operation can be highly mechanized, requires a rela-

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tively limited space, and health problems associated with decomposing organic matter are eliminated by burning the material to an inorganic ash. At best this method, in addition to being expensive, increases atmospheric pollution since large tonnages of material are converted to gases and particulate matter and emitted to the atmosphere. At worst it results in smoke, unpleasant odors, and disagreeable air pollution. In addition, the organic humus and plant nutrients in refuse are destroyed by incineration.

Investigations of the compositing of garbage, refuse, sewage sludge, and other organic wastes as a disposal method show that in addition to reclaiming some of the materials for use as a soil conditioner and fertilizer, fly, rodent, bacterial, odor, and other sanitary problems can be reduced.

History and Status of Composting

Composting may be broadly defined as the production of a relatively stable humus suitable for agricultural soils by means of biological decomposition. The origins of this simple means of preserving the fertility of soil are lost in antiquity, but the practice of composting probably represents one of man's first attempts at conservation. It has been most extensively adopted in those portions of the earth where populations are dense and where, consequently, the need for intense food production is most urgent. For this reason the practice of composting has been largely limited to Europe, Asia, and South Africa. As originally practiced, composting consisted in merely stacking the material and allowing it to decompose without further attempts at control. Later, it became evident that a controlled composting procedure could be used not only to reclaim organic matter, but also to alleviate many of the health problems attendant upon the use of refuse.

The first practical attempt to systematize primitive practices was made by Lord Howard [2] in India where he introduced a procedure for composting admirably suited to conditions peculiar to the Orient. This procedure later became known as the Indore Process because of the locale of its development. It involves placing alternate layers of night soil, garbage, and dry organic matter in heaps or in pits, subsequently turning it once or twice during the 8- to 12-month period required for the mass to be converted into a humus beneficial to the soil and at the same time safe from the standpoint of health. From India the process was introduced into South Africa, where it attained its widest acceptance during World War II. Modifications in which either raw or digested sewage sludge is substituted for night soil have been in use in some localities in England and Scotland for the past 20 to 30 years.[3, 4]

Composting has received its most extensive application in Holland.[5] A semigovernmental body known as VAM (Refuse Disposal Company) produces approximately 160,000 tons of compost annually from municipal refuse, other than garbage, collected from the cities of the Hague, Groningen, and Zendvoort at a centrally located plant at Wyster. The compost is produced by a method which is an outgrowth of the Indore Process. Refuse is stacked in long windrows, sprinkled periodically with drainage liquors from the mass, and allowed to stand until composted. At the end of the process the material is ground and distributed to farmers. In a second and more recent installation at Scheidam, refuse is ground prior to composting and is turned occasionally during the composting process.

Attempts to adapt composting to more industrialized countries by mechanizing the process resulted in the appearance of a number of patented devices during the decade 1920–1930.

Most noteworthy was a cell designed by Giovanni Beccari of Italy.[6] His method employed a preliminary anaerobic stage and a final aerobic phase. The refuse was placed in a cell which was kept closed during the first stage of decomposition, but later supplied with a limited amount of air by means of vents located in the cell wall. Verdier modified Beccari's method by recirculating all drainage liquors to reinoculate the composting material as well as to conserve any nutrients which might be lost with the liquors. The Beccari and Verdier processes have received their widest application in continental Europe, but have not proved acceptable in the United States.

It has not been possible to transplant bodily to this country composting methods successfully practiced in the Old World, largely because they were designed to meet conditions peculiar to Europe and Asia. Length of time needed, labor requirements, difference in the nature of the refuse to be composted have all militated against any successful transfer of these methods to the United States.

Several processes have been designed in an attempt to satisfy the need for a composting procedure suited to the United States. Many of these aim at complete mechanization, some having the operation completely enclosed. Other processes keep mechanization to a minimum by carrying on the actual composting in open piles. The usual design for the enclosed type of operation is a multifloored silo or digester equipped with various means of aeration. Examples of such devices are the Frazer-Eweson, the Earp-Thomas, and the American Composter plants. In these operations, the raw refuse is usually introduced at the top of the structure, passing from one level to the next providing aeration as decomposition takes place, until the finished product is removed at the bottom of the structure. Bins or cells have been used in which the refuse is mechanically agitated to maintain aerobic conditions. According to present information, none of these methods have been used on a large scale, and their operation has usually been confined to highly selected garbage, often with animal manure as an additive.

Composting Process

During a period of more than 2 years the Sanitary Engineering Research Laboratory of the University of California investigated the composting process.[7] A simple and reliable procedure for rapid composting of city refuse was developed and studied which proved satisfactory both on pilot plant and on a field-scale study using all the organic constituents of municipal refuse alone or in conjunction with sewage sludge and other organic wastes. In composting ordinary municipal refuse, the process has four important steps: grinding, stacking, aeration by turning, and regrinding. Initial rough grinding or shredding is essential to high-speed composting inasmuch as it breaks down the natural barriers of organic material to bacterial invasion and offers more surface area for bacterial attack. It also provides initial aeration and insures a thorough mixing of the raw material. In cities where a separate collection system does not exist, the segregation of noncompostable material is a necessary preliminary to grinding. Refuse may be ground in a hammermill or any device which will break up the material without pulping it.

After grinding, the material is stacked in windrows from 5 to 6 feet high and any convenient width, usually about 8–10 feet. The composting material is aereated by turning, i.e., turning the outer material into the interior of the pile from time to time. Inasmuch as the amount of aeration required for

satisfactory composting is not large, turning is not necessary until the third day after grinding if the initial moisture content is below 70 per cent. Subsequent frequency of turning is determined by the moisture content of the pile, varying from daily turning at a moisture content above 70 per cent to turning every third day at a moisture content between 40 and 60 per cent. When composting is completed, the material is remilled to improve its appearance and applicability to the soil. The absence of any reference to inoculation in this brief outline of the method developed at the University of California should be noted. An extensive series of tests proved that inoculation, whether it be by recirculation or by additives, did nothing to alter the course of the process or to speed it.

Composting material usually follows a definite pattern and any deviation from this course may be regarded as an indication of some undesirable development. Within 24 hours after grinding and stacking, the internal temperature of the pile rises to about 50° C., and subsequently continues to rise, though less rapidly, until a maximum of 70–75° C. is attained. This high temperature may persist from 3 to 6 days. As the supply of readily available nutrients diminishes because of the breakdown of organic matter, bacterial activity wanes with a consequent decline in temperature. When this decline has progressed until a temperature of 50–55° C. is again reached, active decomposition is over, and the material is sufficiently stabilized for agricultural purposes. With mixed municipal refuse the entire process lasts from 10 or 12 to 21 days, depending upon the original carbon-nitrogen ratio of the material. The typical course of temperature during the composting of municipal refuse is shown in Figure 1.

As is to be expected, the highest temperatures do not extend to the surface of the pile. The extent of the high temperature zone depends upon the moisture content of the composting material. For example, observations

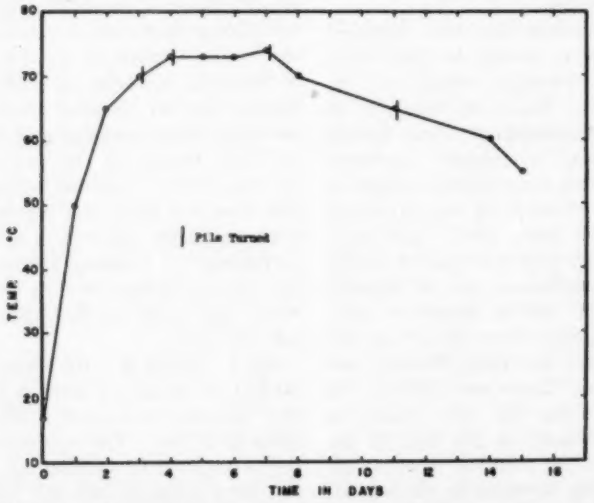

Figure 1—Temperature curve typical of a large mass of aerobically composting material

made on one pile with a moisture content of 61 per cent, showed a temperature of 48° C. at a depth of approximately one quarter inch from the surface, 58° C. at 2 inches, and 68° C. (the highest temperature in the pile at the time of testing) at 4 inches. In another pile with a moisture content of 45 per cent, the 50° C. zone extended to within 3 inches of the surface, 60° C. to within 5 inches and 70° C. to within 6 inches of the surface. Ambient temperatures have little effect on the interior temperature of a pile, inasmuch as temperatures of 70–75° C. were observed at a depth of 2 inches from the surface of a pile when the ambient temperature was as low as 8° C. Although no studies were conducted at ambient temperatures lower than 8° C., it seems probable that if the process could be initiated, heat released through bacterial activity, together with the insulation furnished by the material itself, would prevent any great change in interior temperature, even at external temperatures of 0° C. or less. It is improbable, however, that bacterial activity sufficient to initiate the composting process would take place at temperatures much lower than 8° C. and certainly not at 0° C., or less.

The speed with which the objectionable features of garbage disappear during composting parallels its rapid increase in temperature. Garbage loses its sour odor immediately upon grinding. During the first 3 or 4 days the composting material assumes a faint "cooking" odor which is followed by a slightly musty or earthy odor or by the complete disappearance of all odor. If foul odors should develop, insufficient aeration is indicated. Such objectionable odors are soon dissipated by turning. Similarly, the color of composting refuse soon turns from the grayish green of freshly ground garbage to the dark brown or gray of finished compost.

The process is judged complete when the product can be stored indefinitely and has a C/N ratio making it safe for use on agricultural soils without robbing nitrogen. As previously stated, a gradual drop in temperature to 50–55° C. following the high temperature period indicates a degree of stabilization suitable for indefinite storage. Compost is safe for use on agricultural soil when the C/N is 20:1, or slightly higher, if the carbon is present in a form difficultly available to microorganisms.

Nature of Compost

Finished compost has many characteristics beneficial both to the soil itself and to growing vegetation. Its nutritional value includes nitrogen, phosphorus, potassium, and trace elements essential for plant growth. The nitrogen content of compost from municipal refuse may vary from 1.2 to 1.6 per cent, while elemental phosphorus and potassium will usually be less than 1 per cent. The physical effects of compost to the soil are as important as its nutritional effects. Soil structure as promoted by compost improves the air-water relationship of soil, thus increasing the water retention capacity and encouraging more extensive development of root systems of plants. Other beneficial effects include an increased ability of the soil to absorb rapid changes in acidity and alkalinity and the neutralization of certain toxic substances which may occur.

Composting of Sewage Sludge and Municipal Refuse

Because disposing of sewage sludge with garbage would offer the advantages of a combined operation, the University of California investigated the possibility of a combined composting of the two wastes in a series of experiments in which both raw and digested sludge were mixed with municipal refuse.

Sewage sludge has been successfully composted with municipal refuse in other countries, especially Great Britain and Germany. In the United States the Frazer Process as operated at Bay Shore, Long Island, N. Y., is composting selected municipal garbage with 25 per cent added sewage sludge. In the studies conducted at the University of California, no change could be detected in the performance of the composting material when either type of sludge was used. As shown in Figure 2, temperatures observed exhibited the same rapid rise and attained the same maximum as those found when garbage alone was composted. No unusual odors could be detected even with the raw sludge. The incidence of flies on the composting mixtures was not appreciably different from that on composting refuse alone.

The amount of sludge that may be added to refuse is determined by the upper limits of permissible moisture content and will vary according to the initial moisture content of the sludge. It would appear that any amount of sludge could be added to refuse for composting provided that the sludge was dewatered so that the moisture content of the mixture would be satisfactory. At Stuttgart and Baden Baden, Germany, sludge, after primary treatment, is dewatered to a moisture content of approximately 75 per cent in open drying beds, and is then mixed with municipal refuse.[8] If the University of California method is followed, sludge should be added to refuse directly after grinding, either before or at the time of stacking.

Public Health Aspects of Composting

The apparent absence of health hazards is a characteristic common to all well managed composting operations in the Old World. This is especially significant inasmuch as potentially dangerous night soil is used in producing compost in many regions. As a result of studies of existing composting practices in England, the Medical Re-

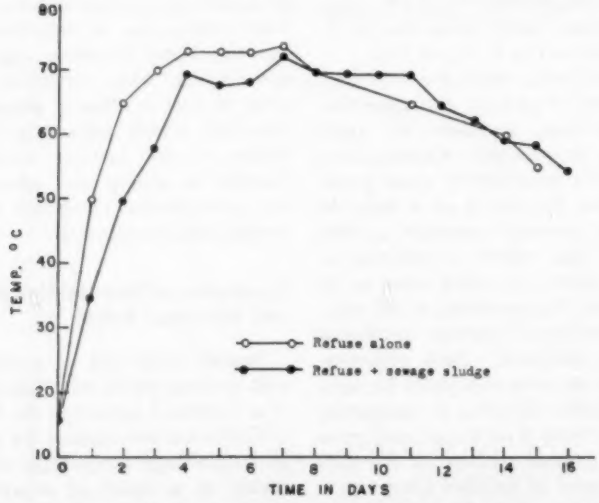

Figure 2—Curves showing course of temperature during composting of refuse alone and with digested sewage sludge

search Council was able to find no risk to human health from the manufacture of compost. Van Vuren [9] was unable to demonstrate any health hazards in properly managed composting operations in South Africa. His findings were confirmed by Dr. Blair,[10] Union of South Africa Health Department; Loots,[11] South African Department of Agriculture; Dr. Hamblin, city engineer of Johannesburg [9]; Scharff, of Malaya [9]; and others. The Agricultural Research Council in England [12] noted also that fly larvae were drastically curtailed in the compost operations of England. Van Vuren reported similar observations made in South Africa.

No similar record of experience in the United States is available which might lead to the conclusion that a composting operation would meet our highest public health standards. Experimental results, however, quite clearly indicate that a properly conducted composting operation which meets requirements of reliability, speed, and economic feasibility acceptable to Americans will be also hygienically and aesthetically acceptable. All of these features are best insured by a process which involves thermophilic temperatures and employs aerobic decomposition.

To obtain thermophilic temperatures through biological activity, a great deal of heat must be released by the microbial organisms. This heat represents energy in excess of the energy requirements of the bacteria. Bacteria obtain energy through breakdown of carbon compounds, especially the sugars. Energy released from such breakdown under aerobic conditions greatly exceeds that under anaerobic conditions. For example, if glucose is dissimilated anaerobically only 26 K cal. of the potential energy of the glucose molecule are released. But if glucose is dissimilated under aerobic conditions, 484–674 K cal. may be released. Thus, an aerobic process is more efficient than an anaerobic one and is consequently more rapid. In addition, it is not accompanied by the production of putrefactive odors characteristic of anaerobic decomposition and resulting from reduced compounds together with various intermediate decomposition products.

Figure 1 shows thermophilic temperatures typical of properly composting material observed during the University of California studies. Table 1 lists the

Table 1—Thermal Death Points of Some Common Pathogens and Parasites

Organism
Salmonella typhosa: No growth beyond 46° C.; death within 30 minutes at 55°–60° C.[22]
Salmonella spp.: Death within 1 hour at 55° C.; death within 15–20 minutes at 60° C.[22]
Shigella spp.: Death within 1 hour at 55° C.[22]
Escherichia coli: Most die within 1 hour at 55° C. and within 15–20 minutes at 60° C.[22]
Endamoeba histolytica cysts: Thermal death point is 68° C.[23]
Taenia saginata: Death within 5 minutes at 71° C.[23]
Trichinella spiralis larvae: Infectivity reduced as a result of 1-hour exposure at 50° C; thermal death point is 62–72° C.[23]
Necator americanus: Death within 50 minutes at 45° C.[23]
Brucella abortus or suis: Death within 3 minutes at 61° C.[23]
Micrococcus pyogenes var. aureus: Death within 10 minutes at 50° C.[9]
Streptococcus pyogenes: Death within 10 minutes at 54° C.[9]
Mycobacterium tuberculosis var. hominis: Death within 15–20 minutes at 66° C.; or momentary heating at 67° C.[9]
Corynebacterium diphtheriae: Death within 45 minutes at 55° C.[9]

thermal death points of a number of pathogens, parasites and parasite ova. By comparing the two it may be seen that the highest thermal death point is appreciably lower than the maximum temperatures found inside a composting pile. The magnitude and duration of high temperatures, as well as the antibiosis characteristic of a mixed population of microorganisms, offer sufficient basis for believing that no pathogens, parasites, or parasite ova survive the composting process. Plans are in progress to investigate further this point. The rapid increase in temperature to 50° C. within 24 hours destroys any fly larvae which survive the grinding operation, and the continued high temperature maintained until stabilization of the material is completed hinders further breeding of flies. Experience in Europe indicates that grinding or shredding reduces the qualities of the material which make for fly production.

When composting is done in open piles, such as those described, the high temperature zone extends to within 4–6 inches of the surface. This fact makes turning necessary for pathogen and parasite destruction regardless of its function in aerating the mass. One turn should be enough to eliminate parasites and pathogens by exposing them to lethal temperatures if the outside surface material is completely turned to the inside of the pile. Additional turnings are required, however, to disrupt the life cycle of some flies which are able to complete their cycle in 3 or 4 days if permitted to remain undisturbed in the warm outer layers of the pile. That turning was effective was demonstrated by Van Vuren [9] who showed that when composting by the Indore Process three turnings would kill all fly larvae. In careful studies made by the University of California in cooperation with the Bureau of Vector Control of the California Department of Health of refuse containing fly eggs and larvae and of compost piles which were inoculated with fly eggs and larvae, no fly eggs, larvae, or pupae could be found in any part of the composting piles. Actually, the composting material itself was demonstrated as unsuitable for larval development from eggs, and the high speed hammermill used in grinding the garbage proved very effective in destroying the multitudes of fly larvae found in raw garbage as it was delivered from the collection vehicle.

When sewage sludge is composted with refuse it is especially important that the process be so operated as to insure thermophilic decomposition and as to bring all fractions of the material into the high temperature zone at one time or another during the period of active decomposition. This is just as true for digested as for raw sludge. Studies made on the survival and incidence of pathogenic organisms in sludge treated by present sewage disposal methods indicate that a considerable number of such organisms can remain viable throughout most disposal processes and continue to survive in sludge stored for periods varying from a week to 6 months depending upon the organism and the nature of the material.[13-16] Many of the reports cited indicate also the adverse effect of increasing temperature on survival of organisms. For example, Ruchhoft [17] found that the survival of Salmonella typhosa in stored sludge was 80 days at 10–16° C., and only 13–14 days at 20–22° C. Newton, et al.,[13] in a study of the effect of sewage treatment processes on ova and miracidia of Schistosoma japonica, report that at temperatures of 8–18° C. storage periods of 2 to 3 months were needed to render ova nonviable, whereas at 18–24° C. only 3 weeks was needed. Keller [18] reports that although mesophilic digestion of sludge does not destroy eggs of Ascaris lumbricoides, thermophilic

digestion at 53–54° C. is very effective. Inasmuch as maximum temperatures of 70–75° C. were attained in piles of composting sludge and municipal refuse, it seems safe to assume that pathogenic organisms are destroyed. This assumption is confirmed by reports from countries where years of experience and observation have shown that composts made from night soil and refuse, as in India and South Africa,[9, 11, 19] or from sewage sludge and refuse, as in Great Britain, Germany, Australia, and New Zealand,[11, 20] have constituted no public health problem.

Especial care must be exercised when night soil or sewage sludge is added if the health of the workers is to be safeguarded. Turning must be thorough and adequate. Many operations in South Africa were abandoned after the war because of health hazards and nuisances resulting from the carelessness in conducting composting operations involving the use of night soil. Sufficient standby equipment should be available to prevent an accumulation of refuse in case of a breakdown.

Future of Composting in the United States

The likelihood that a composting method for refuse disposal will be extensively utilized with resulting alleviation of public health and other problems associated with refuse disposal depends upon the economics of the operation. The economics of the operation in turn are determined by the cost of production and the commercial value of the finished product. Because of the absence of municipal-scale composting in this country, information on both of these aspects is at present tentative. There are good prospects that the economic value of composting may reduce the cost of disposing of municipal wastes and sewage sludge. When part of the present cost of disposal of refuse and of treating sewage (as much as 5–6 dollars per ton for incineration) is subtracted from the cost of producing compost, a municipality should be able to produce it at a price which would guarantee its acceptance. The Compost Corporation of America reports that it is designing a composting plant at Oakland, Calif., to handle 260 tons per day of mixed raw refuse. Its production costs, market, and financial analysis indicate that a substantial profit can be realized.[21]

Summary

Present refuse disposal methods are generally unsatisfactory from the standpoint of health because of flies, mosquitoes, rodents, odors, and smoke associated with dumps and land fills and the air pollution which accompanies incineration.

Composting is the stabilization of organic matter by biological decomposition, producing a humus useful to agricultural soils. It has been practiced in a simple form in Asia for centuries, and in a more highly organized manner in Europe during the past several decades. Methods used, however, are not directly applicable to United States conditions.

A simple and reliable composting procedure for municipal refuse is reported by the Sanitary Engineering Research Laboratory of the University of California. Important steps in the process are grinding, stacking, aeration by turning, and regrinding. Compost is produced by aerobic thermophilic microorganisms in 10–20 days. No inoculums are required. Temperatures in the 70–75° C. range persist from 3 to 6 days during which, with proper turning of material, pathogens and insect eggs, larvae and pupae are destroyed. The final product has many characteristics beneficial both to the soil and to growing vegetation.

ACKNOWLEDGMENTS—Many individuals contributed to the studies on which this report is based. Special acknowledgments are due Bradley J. Card, sanitary engineer, for participation in the investigation; Richard F. Peters, E. Myers, and others of the Bureau of Vector Control of the California State Department of Health, for cooperation in experiments with flies; Owen Dyer, of the city of Berkeley, for cooperation in field studies; and to P. H. McGauhey of the Sanitary Engineering Research Laboratory staff for editorial assistance.

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Wilinsky Lecture Fund

The Charles F. Wilinsky Lecture Fund has been established at the Harvard School of Public Health in honor of the retired executive director of the Beth Israel Hospital and former deputy health commissioner of Boston. Given by Dr. Wilinsky's children and grandchildren, the fund will be used to bring to the school the nation's leading hospital administrators to discuss the role of the hospital in public health.

Brig. Gen. James S. Simmons, USA (Ret.), dean of the school, has invited Dr. Wilinsky to give the first Wilinsky Lecture. Dr. Wilinsky has accepted and will discuss "The Relation of Hospitals and Health Departments in Tomorrow's World" on April 28, 1954.

Dr. Wilinsky is a Fellow and past president of the American Public Health Association.

Fertilizer Value in Waste Disposal Methods

LEROY W. VAN KLEECK

Dried or partially dewatered sewage sludge makes an excellent soil conditioner and a good—though incomplete—fertilizer. Its use should be fostered for several good reasons. This being the case, should not the "landed gentry" of the public health profession set a good example by using the product and letting the people know they use it?

✢ The Mongolian race has maintained high soil fertility for many centuries by the application of human organic wastes to the soil. In this respect, no doubt through a fear of infection with disease, Europe and America have largely lost direction. It is becoming increasingly obvious, however, that we cannot continue to draw on the fertility of our soils and redress the loss by the exclusive use of artificial fertilizers. The recurring dust bowls in the United States are but one sign of our need for soil humus materials. Insect ravages and diseases of plants are another. Less tangible, but nonetheless significant, is the possibility that crops grown on impoverished soils will be impoverished themselves and our health may suffer in turn.

By proper processing, sanitary engineers can safely return most human wastes back to the soil where they belong. To do otherwise is to lose a natural resource. There are three principal means for utilizing waste materials in soil fertilization: use of sewage sludge; use of broad sewage irrigation or sewage farming; and use of garbage.

Use of Sewage Sludge

Members of this section need no introduction to the meaning of sewage sludge. The characteristics of liquid, raw, primary, digested, humus, activated, dewatered, and heat-dried sludges are well known. The current sanitary engineering literature is replete with references on the use of sludge. The Federation of Sewage and Industrial Wastes Associations' Manual of Practice No. 2, Utilization of Sewage Sludge as Fertilizer,[1] alone reveals a bibliography of 251 references on the subject.

In spite of wide discussion on sludge use, thousands of tons of suitable sludge are still wasted annually in many sections of this country. What types of sludge are suitable and safe for use? How should these sludges be used and for what purposes? Why is sludge being wasted in many communities? Let us discuss these questions in turn.

Types of Sludge Suitable and Safe for Use

Heat-dried raw activated sludge is the best sludge product. Such sludge retains most of its organic solids and it contains more nitrogen than other sludges. It is also safe hygienically as

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Figure 1—A sludge grinding operation. Sludge ground to pea size shown in left foreground

pathogenic bacteria, together with the cysts and ova of intestinal parasites and hookworm eggs, are destroyed. Such sludge, if not well worked into the soil does, however, encourage surface molds and an odor may persist from the decomposition of its fresh organic matter. Some crop retardation may also be experienced unless the sludge is first composted with soil or harrowed into the soil for a time prior to planting the crops. All of the above statements apply similarly to heat-dried raw primary sludge, except that such sludge contains less nitrogen.

Digested dewatered sludges from all sewage treatment processes are materials of definite value as a source of slowly available nitrogen and humus. Such sludges have a very favorable effect on soil properties resulting in increased moisture-holding capacity and greater friability. There are few weed seeds present. Reports of sickness traceable to use of either vacuum-filtered or air-dried digested sludges continue to be negative. Various states have, however, outlined precautionary measures to be taken in digested sludge utilization. Appendix A gives the precautionary steps advised by the Connecticut State Department of Health. Grease of animal origin and lime or ferric chloride employed in conditioning sludge for vacuum filtration are not harmful to soils. The relatively high concentrations of boron, copper, and zinc in digested sludges,[2] as compared with other fertilizing materials, may be toxic to certain crops, especially beets and spinach. This injurious effect is usually prevented by judicious liming. Neutral or alkaline sludges are much less likely to be toxic.

The use of liquid sludge, either raw or digested, except under special conditions, is not recommended by the writer. Such sludge is bulky, there is the possibility of objectionable odor, and more likelihood that pathogenic or parasitic organisms may be present than in dewatered stored digested sludges. Neither is dewatered raw primary sludge without heat-drying recommended for use. Such sludge is odorous, it has an unfavorable effect on soils, and is a potential carrier of disease.

Use of Heat-Dried Activated Sludge and Digested Sludge

It is increasingly apparent that intelligent use of both sludge (or any humus material) and mineral fertilizer is necessary if either is to have maxi-

mum effectiveness for crop production. Sludge is primarily a soil conditioner, not a balanced food for plants. It is a mistake to compare sludge only in terms of soil nutrients with other fertilizers. Sludge furnishes humus which improves soil texture and promotes plant growth, and it is for this value that sludge should be judged. Artificial fertilizers are needed for most soils to supply plant food, particularly additional potash. Dependence, however, exclusively upon commercial fertilizers without consideration for the maintenance of humus content and good soil structure is an unsound practice.

Sludge may be applied as a top dressing in the hill, or spread, then plowed, or spaded into the soil. Sludge, like manure, can be added in varying rates depending on the soil and crop. In general, applications of 25–50 cubic yards per acre (approximately 15–30 tons, moist weight) are satisfactory. Rates as high as 150 cubic yards per acre are more effective in improving soil texture, provided vegetables susceptible to toxicity from boron, copper, or zinc are not grown. There are indications that first vegetable crop yields are improved by low application rates of 10 or 12 tons per acre. The lower rates reduce the toxic effects of the elements mentioned previously. No detrimental effect is noted from these toxic elements in sludge when sludge is used for grass, trees, or shrubs. The effects appear limited to certain vegetable crops.

Experience shows that the continued use of any type of sludge unless previously conditioned with lime requires the periodic addition of lime to the soil to prevent harmful acidity. Lime will also precipitate the copper, boron, and zinc, often present in excessive amounts, thereby reducing their solubility in the soil and preventing harmful effects. For most vegetable crops, soil liming about every three years to maintain a soil pH between 6.0 and 7.0 is satisfactory. Exceptions are potatoes, pumpkins, muskmelons, strawberries, raspberries, watermelons, peppers, eggplant, and tomatoes which will grow satisfactorily in soils of pH 5.3–6.0. Likewise, acid-loving plants, such as azalea, rhododendron, or blueberry, do not require lime, and an acid sludge should preferably be applied.

The greatest physical benefits from organic matter occur within the first two years. Then the favorable effects gradually diminish. Sludge applications should be repeated therefore every three or four years. Delayed or reduced germination of some seeds will be experienced on soils recently treated with sludge. If the seed application is ample to insure a good stand and sufficient time is allowed, seed germination is not, however, a serious difficulty.

Shredding sludge to about pea size enhances its salability. This is clearly indicated by the increased demand noted at sewage plants where grinding is practiced.

Sludge is particularly adapted to lawns. It deepens the green color of grass and stimulates a luxurious growth. Flowers respond well to sludge. Trees fertilized with sludge frequently have a healthier foliage, both in amount and color, and retain their leaves longer in the fall. In the vegetable garden the gardener might well turn to sludge for his humus needs in view of the scarcity of animal manure, bearing in mind the safeguards listed in Appendix A. If you believe the old axiom that one picture is worth a thousand words, you may care to see the pictorial evidence of the benefits of sludge in soil fertilization on the author's own premises.[3]

Why More Sludge Is Not Used

Sludge, particularly dewatered digested sludge, has not been used more extensively for several reasons.

An esthetic dislike because of its

source: Since properly digested, dried, and stored primary sludge and heat-dried raw activated sludge have been established as safe hygienically for application to the soil, there is little room for argument from the health standpoint when such sludges are used.

Fear of odors from its use: Many of the more common animal manures, including cow, pig, and sheep wastes, have more odor than sludge, especially if applied before thorough composting. Well digested sludge has a tarry or earthy odor which is not of a carrying nature. If sludge is thoroughly ploughed or cultivated into the soil, there is no perceptible carrying odor.

The lumpy or chunky physical form of much sludge cake which makes it unsatisfactory for lawns, shrubs, and flower beds: Heat-drying and grinding, or grinding alone, produces a product much more suitable for home use and such sludge usually finds a ready market. Frost action on stored sludge also helps to crumble large sludge particles.

A dearth of information among laymen and even agriculturists concerning the availability of sludge and its value: Many soil experts appear unaware of the potential source of humus and nitrogen in sludge and have failed to encourage its use to the extent possible. Recommendations from such experts would go a long way in promoting the development of a sound program. The recommendations of state and local health departments should also be followed.

Lack of promotion for its use by local officials: Because of lack of time, this reason is understandable. The primary job of sewage treatment plant personnel is the protection of the public health and the prevention of nuisance from raw sewage—not sale of fertilizer. However, with a little effort, much of the dewatered digested sludge produced in this country and now wasted could be used on the land. With so much digested sludge now available in many local communities, it seems foolish, indeed, to pay $1 to $2 a pound for one of the many currently advertised commercial soil conditioners. These conditioners rarely treat more than 10 or 15 square feet of soil per pound of material and generally are helpful only to clay soils. Digested dewatered sludge will benefit both clay and sandy soils and it is usually available at a maximum charge of $1 to $2 per ton at the sewage plant. Including average hauling charges ($2 to $3 per ton), this makes the cost of sludge about 1/60 that of most commercial conditioners. One ton of dewatered sludge will condition 2,000 to 4,000 square feet of soil.

Because of large sludge quantities, presence of harmful industrial wastes, or other factors, the disposal of sludge by means other than as fertilizer has been found more practical or economical in many large treatment plants: This reason for lack of sludge use is more valid. Demands for sludge as fertilizer are seasonal and storage facilities are expensive. The cost of purchase and operation of drying, grinding, and bagging machinery is considerable. The necessary bookkeeping adds to administrative costs.

Use of waste heat from refuse incinerators reduces costs to a practical level for heat-drying of digested sludge. Two plants in Connecticut combine sewage treatment and refuse incineration at one site, thereby making this procedure possible. Such heat-dried digested sludge also has a market for use as a base in commercial fertilizers, thereby fortifying their organic content. At many other large sewage plants, at least a part of the sludge output could readily be made available for seasonal use as fertilizer by stock-piling sludge cake or arranging for truck loading direct from the vacuum filter conveyor belt. Also, the time may come when

we will think less of economics and more of the humus needs of our soils.

Broad Irrigation or Sewage Farming

Broad irrigation or sewage farming has been used quite extensively in Europe and in some arid or semiarid areas in the United States. As a method of sewage disposal, it has been largely superseded today by other methods because of the large areas required, the objectionable odors which are likely to occur, and the experience that treatment of the sewage is often given secondary consideration.

Aerobic decomposition of the organic matter in sewage occurs when proper dosing rates are applied to the soil. The value to crops from sewage farming is the available content of nitrogen, phosphorous, and potassium and particularly the water content which, as you know, is about 99.8 per cent of the total content of sewage. Presettling of the sewage is held to be highly desirable. If the grease content of the sewage is high, soil clogging may occur.

Keefer [4] states that in Europe the sewage from 138 to 675 persons is applied daily at sewage farms to one acre of land. In gallons the variation is 4,800 to 36,500 per acre of land depending on the character of the soil. Sewage farms in Texas are operated at rates of 4,500 to 25,000 gallons of sewage per acre per day. With the best soils, it appears that 36,000 gallons per acre per day for presettled sewage is about a maximum rate for satisfactory operation. With poor soils, the maximum rate is often 6,000 to 12,000 gallons per acre per day.

This waste disposal method is obviously limited to small communities with ample available land. The health danger cannot be overlooked and no crops should be raised unless the edible portions grow above the ground or the crops are cooked before eating. Even then, infection of human beings is possible by handling any vegetables or fruits having contact with sewage. In most localities in this country—except where the benefits of irrigation are a highly important factor—the utilization of properly conditioned sewage sludge for fertilizer appears to be from all angles the sounder practice.

Use of Garbage

The growing practice of home garbage grinding will increase the tonage of sludge available for fertilizer. Likewise, central grinding stations or adding ground garbage directly to sewage plant digesters will increase the production. Garbage solids are as readily digested as sewage solids and plant gas production is proportionately increased. The main requirement is that the sewage plant digester capacity be adequate for handling the additional load, and particular consideration also needs to be given to adequate grit removal equipment and means for breaking up digester scum. The trend is desirable from the viewpoint of availability of additional humus material for soil fertilization. Garbage grinding also is to be greatly preferred hygienically to open dumping or hog feeding of raw garbage, both of which are so commonly employed.

Garbage composting is currently receiving much attention in this country. Recently several papers on this subject were presented at the American Society of Civil Engineers annual meeting. Lunt [5] has outlined the minimum lay-out requirements for a composting project.

Although composting may be the most desirable garbage disposal method from the viewpoint of reclamation and soil economy, there are at present too few engineering data, too few cost data, and too few analytical data concerning the basic factors involved to say whether any particular composting method will be successful for garbage disposal in the

United States. Some installations have been successful and others not. Mechanical handling of nondecomposable refuse needs improvement, or costs of separating and disposing of such material may be too high. Consideration must be given to the low temperatures prevalent in New England and many other sections of this country during a large portion of the year when open composting is proposed. The best the author can say in support of garbage composting at present is: "Let us wait and see—and hope!"

Appendix A

Memorandum on Use of Sewage Sludge as a Soil Conditioner

Connecticut State Department of Health

Dried digested sludge has been utilized in the past from sewage treatment plants in Connecticut as a source of humus or fertilizer for soils. Recently, both technical and popular articles have appeared, pointing out the advantages of organic farming, so that a quickening interest in sludge utilization may be experienced.

The State Department of Health is concerned under the state law with the operation of public sewage treatment plants. There are outlined below the conditions under which sludge use on soils is permitted. In case of questions about sludge use, it is recommended that the local health officer be consulted and the health officers should always be advised in case of proposed transportation between towns. Superintendents and operators of sewage treatment plants are requested to see that all sludge users are informed of the following precautionary measures:

1. The spreading of raw (undigested) sludge in any form, unless heat-dried to a temperature of at least 1,000° F. for 10 seconds, should not be carried out. Septic tank sludge should be considered as raw sludge.

2. The discharge of liquid digested sludge on any land, other than the immediate grounds of a sewage treatment plant, is prohibited, unless the method employed and the discharge location are previously approved by the State Department of Health and the local health officer.

3. Air-dried, or vacuum filter-dried, digested sludge, preferably stored for a period of several months, may be used on lawns, and the soil surrounding trees, shrubs, and flowers. It may also be used on land utilized for vegetable growing, provided the edible portion of the crops grow above the ground or the crops are such that they are cooked before eating.

4. In the case of vegetables grown in contact with the soil and eaten raw, dried digested sludge should always be applied to the soil the previous fall and plowed under either immediately or the following spring before the crop is planted. No additional applications of sludge should be made during the growing season.

5. Heat-dried sludge is safe for use under all conditions because of the destructive action of heat upon the bacteria.

6. The general public should be warned to avoid handling sludge with the bare hands and to wash the hands carefully with soap and hot water after sludge handling operations.

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Applied Epidemiology in Venereal Disease Control

JAMES K. SHAFER, M.D., F.A.P.H.A.

Effective as penicillin has proved to be in the treatment of syphilis and gonorrhea, these venereal diseases cannot easily be treated out of existence. The providential availability of this potent drug makes all the more imperative use of the productive epidemiological procedures discussed here.

✣ Just 10 years ago Dr. Mahoney described at a meeting of the American Public Health Association the preliminary results achieved with penicillin in four patients having acute syphilis. As he predicted at that time a rebuilding of the structure of syphilotherapy followed. That rebuilding was speedily accomplished, so that the full potential of penicillin in venereal disease control could be quickly realized.

Not only the structure of treatment but the whole venereal disease control program has undergone radical revision in the past decade. It is not my intention to detract from the importance of penicillin in the developments of these 10 years. Nevertheless, I should like to emphasize that a good deal more than this remarkable antibiotic has been involved, for, manifestly, a public health program of disease control comprises more than effective treatment. I doubt if there is any better example of that truisim than in syphilis control. Imperfect as arsenic-bismuth therapy was, the alliance of that mode of treatment with other public health procedures permitted a rational beginning of syphilis control. But it was only after highly effective penicillin treatment was joined with a strong epidemiological attack upon syphilis that the rates of this disease began to decline in the United States.

From the administrative viewpoint epidemiology is something more than a medical discipline, it is also the marshaling of technical skills into a working program directed at a disease. In the venereal disease program the epidemiological approach has developed as an integral part of the control machinery of every state. This nation-wide integration has been facilitated by rapid and thorough communication between the states and among all levels of venereal disease control workers. Through seminars, training courses, and regularly issued publications, current ideas and materials, both scientific and administrative, move readily from laboratory to treatment center to health department in all directions. For contact information there are specialized channels which will be discussed later. Against this background of established means of operation and communication, I would like to examine some of the practical aspects of venereal disease epidemiology, touching as we go upon continuing problems, as well as procedures that work well.

One of the striking effects of peni-

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cillin upon the venereal disease control program was the opportunity it provided for concentration upon case finding. Relieved of the burden of case holding, venereal disease control officers turned quickly to the task of fashioning a more aggressive program in venereal disease epidemiology, a laborious and complex process. All diseases have their frustrating epidemiological problems and syphilis is no exception. The sexual mode of its transmission erects formidable barriers to the process of tracing an infection from a known patient to the large network of unknown patients. Successful interview of the venereal disease patient for his sex contacts has required special approaches and technics. The basic principle from which the interviewer never departs is that his function is to obtain the names and addresses of contacts. Such factors as patient education, medical guidance, and assistance in solving personal and social problems are brought into the interview only to the extent that they will help to elicit additional contact information. Other services in venereal disease control provide the educational experience; the interview has a primary purpose and that purpose is kept clear at all times.

The venereal disease program utilizes nonmedical personnel in case finding. Whether the interviewer is one of these case finding specialists or a nurse, the yield of contacts per interview is enhanced by a few days or weeks participation in one of the schools of interviewing operated as part of the venereal disease control program. An important part of this training is a sharpened awareness that many venereal disease patients have a wide circle of sexual partners. In the schools, the student, under the tutelage of experienced interviewers, personally conducts both interviews and investigations. At all times he is observing and working with patients, and he learns much about their patterns of behavior as well as the technics of eliciting contact information.

Like all disease organisms the spirochete and the gonococcus have no regard for jurisdictional lines between health departments. The carriers of these organisms move about freely. Accordingly, contact information must have free and at the same time confidential transit from one health jurisdiction to another. The chief instrument through which this exchange takes place is a multiple epidemiological form, now largely standardized between the states and between the military and civilian venereal disease control operations. This form, used in conjunction with the telegram and the telephone, has proved a useful tool in the passage of contact information between health departments.

Fairly early in the history of venereal disease contact investigation it was realized that a means of measuring its effectiveness was needed. From this need statistical indexes have been developed to serve as yardsticks by which contact interview-investigation in different areas may be compared and its efficiency in the same area gauged over a period of years. One of the problems frequently met in interviewing is that of the patient who names no infected contact. In an attempt to solve this problem we have recently been using an epidemiological index of individual patients. Where this index is zero (which may occur as often as once out of every three or four patients interviewed) reinterviewing sometimes succeeds in identifying the source contact and possibly one or more spread contacts.

In the course of analyzing morbidity reports, material from case finding programs and the results of special studies, a substantial amount of epidemiological data on venereal disease

has accrued. These data have pointed to the geographic areas, the socioeconomic levels, and the age and racial groups where venereal disease is most prevalent. These data have been utilized as guidelines for program planning. For example, selective blood testing programs have been employed within the last year in population groups among whom syphilis is known to be prevalent. In certain metropolitan areas these selective surveys have uncovered rates of seropositivity ranging from 6 to 13 per cent, about half representing patients in need of treatment.

For reasons which I shall touch upon later, syphilis has been the chief target for venereal disease control. A glance at syphilis morbidity and mortality figures is rewarding to the venereal disease control worker because both rates have dropped materially over the past few years. Nevertheless, syphilis in 1951 ranked third in morbidity among notifiable communicable diseases. Certainly, an even more formidable problem is the group of 2,100,000 estimated cases of undiscovered or inadequately treated syphilis among our people. Just how many of this group will progress to late symptomatic syphilis we cannot, of course, precisely foretell, but we can predict that without treatment about 12 per cent of them will proceed to disability or death from syphilis. A 20-year study of untreated syphilis conducted by the Division of Venereal Disease at Tuskegee, Ala., gives further insight into the probable fate of this group. Our findings in the Tuskegee study show that untreated syphilis reduces life expectancy by 17 per cent. In 40–60 per cent of the untreated patients with a positive serologic test for syphilis (S.T.S.) when last seen prior to death, some involvement of the cardiovascular system was found at autopsy. For both economic and humanitarian reasons the large number of persons with undiscovered syphilis in our population should be identified. The problem is principally one of applied epidemiology, for if we find these people early enough, present methods of therapy will protect them from the killing and crippling consequences of their disease.

I should like, also, to discuss the problem of gonorrhea. In 1951 it ranked second in morbidity among reportable communicable diseases. Until 1953 gonorrhea rates were declining, although slowly in comparison with those of infectious syphilis. Now, however, the morbidity of this disease appears to be leveling off at about 245,000 reported cases per year. Both syphilis and gonorrhea are transmitted sexually; both are susceptible to penicillin therapy. Why then the discrepancy in rates of decline? While the answer to this question is not clear-cut, a backward glance at venereal disease control strongly indicates that the divergence in syphilis and gonorrhea rates is largely due to the epidemiological effort directed against the one and withheld from the other. This direction in program was dictated by limitations in personnel and funds which prevented our proceeding with equal vigor against these two diseases. Syphilis was chosen for the weight of the case finding program because it is potentially the more serious. Moreover, it was felt that the discomfort experienced by the male gonorrhea patient would cause him to volunteer for medical care, and, finally, it was thought that the increasing availability of penicillin, plus its specificity for gonorrhea, would tend to treat this disease out of existence without a concerted case finding drive.

However hopeful this reasoning appeared in the late 1940's, the fact is that gonorrhea has not been treated out of existence. But we are now in a position to test the hypothesis that the epidemiological procedures which are succeeding against syphilis will succeed against

gonorrhea. Since syphilis rates in certain areas have been brought down to the point where, with vigilance, they can be held in check, we can divert some of our case finding energy to gonorrhea.

Control of this disease, however, has some peculiarities which demand adaptation of the interview-investigation process. Most important is the significance of the infected female. An examination of our clinic reports shows a marked preponderance of male patients. This imbalance indicates that gonorrhea control has not found a proper proportion of female patients to halt transmission of the disease. Moreover, many of the males appearing in our clinics are "repeaters"; they are treated and cured of gonorrhea only to return to an infected female, often the same one, where they reinfect themselves.

With this picture in mind, VD control workers have evolved a plan of "speed-zone epidemiology"—"peppy epi"—which attempts to attack gonorrhea at the point of epidemiological vulnerability. It has been demonstrated that while the incubation period of experimentally acquired gonorrhea in the male has a 31-day range, 82 per cent of the infections produced clinical symptoms within six days. Consequently, the speed-zone program concentrates upon female contacts of the male gonorrhea patient within a period beginning six days before the onset of his clinical symptoms and ending at the time of his appearance in the clinic. Interview of the male patient is confined to a search for his contacts during this period. Speedy investigation is essential to the success of the plan.

A final evaluation of the speed-zone program will depend upon whether or not the incidence of male gonorrhea cases decreases. The early reports now coming in are encouraging. About 70 per cent of the contacts identified for the speed-zone areas are being brought to examination and treatment within five working days. From the procedural viewpoint, the telegram once again is proving an effective means of bringing contacts to treatment, speedily and at low cost. Of all contacts named within the speed-zone areas and sent telegrams, about 38 per cent responded within 24 hours. Of all contacts examined, 21 per cent have come to the clinic in response to the telegram.

I would like to emphasize two things: In the first place, development of a venereal disease control program has been based upon study of the principal elements which comprise a public health attack upon disease, not only on research in diagnosis and treatment but also upon study of epidemiological and operational technics. A high degree of control has been brought to syphilis with treatment as the basic control measure. This has occurred not only because effective methods of treatment have been developed, but also because ways have been found to bring the infected person and his contacts to diagnosis and treatment.

Second, declines in venereal disease rates, particularly rates in early syphilis, have brought us to a phase of redirection in program, from a mass operation to a more selective one. For example, studies of age-specific rates in New York City show that in the group between 15 and 24 years of age early syphilis and gonorrhea had not declined in 1950 from the rates of 1940. With some 255,000 infectious cases reported in 1953, venereal disease control cannot progress by a haphazard, incidental operation. The prime lesson of our experience is that an organized public health effort is required.

We are observing no changes in patterns of sexual behavior which would suggest that opportunities for transmitting venereal disease are decreasing in frequency. If the rate of illegitimate live births is an index of sexual activity, it is worth noting that this rate increased

73 per cent in the years from 1938 to 1947 and unofficial figures for the following two years indicate no falling off in that trend. In such an environment of sexual activity, epidemic outbreaks of venereal disease, varying in dimensions, may be anticipated as long as an appreciable amount of infectious venereal disease remains in the population. These outbreaks may be at best forestalled, at least controlled, only through alert epidemiological services. These services are a public health function, essential to an efficient control operation.

Let us not delude ourselves that venereal disease can be easily treated out of existence, or that an organized control effort is an anachronism. The heart of the matter today is whether, with venereal disease under partial control, we shall dismantle our control machinery instead of reorienting it to changing needs.

Kimble Methodology Research Award

The Conference of State and Provincial Public Health Laboratory Directors, through its Kimble Methodology Award Committee, invites nominations for the third annual Kimble Methodology Research Award. The award, made possible by the Kimble Glass Division, Owens-Illinois Company, consists of $500 and a suitably inscribed plaque. The award is presented each year at the annual meeting of the American Public Health Association.

The work of a candidate is considered if it represents a fundamental contribution to the development of diagnostic methods for use in the public health laboratory or the adaptation to such use of a fundamental contribution. The work must have been completed since January 1, 1949. Nominations, which may be drawn from the United States, its territories, and Canada, must be accompanied by a reprint or summary with bibliography and a statement of the considerations that justified the recommendations of the study.

Nominations for the 1954 award must be received by May 15, 1954. Those received later may be considered for 1955. Further information and nomination blanks from Dr. Alfred F. Lazarus, School of Medicine, University of Washington, Seattle 5, Wash.

Morbidity Experience of Subscribers to a Prepaid Medical Care Plan

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Patterns of illness among industrial families of a Canadian city, as revealed in this statistical analysis, would seem representative of urban populations on both sides of the border and hence of immediate interest to United States public health administration.

✣ The measurement and analysis of morbidity are still in a stage of development. Since the available technics differ, they lead to results which represent different facets of the total picture of illness. This over-all picture must be pieced together from the data derived from such divergent approaches as the household survey,[1-3] the industrial survey,[4] and the analysis of physicians' services.[5, 6] The purpose of this paper is to report the more general findings obtained by the last technic, one which, to some degree, has been neglected in the literature.

This study was made possible by the cooperation of the Windsor Medical Services, Inc., in Windsor, Ontario, Canada, and is based entirely upon their records of physicians' services to the plan's subscribers. Windsor Medical Services, Inc. (henceforth designated as WMS), is a voluntary prepaid health insurance plan, initiated and operated by physicians in Windsor. In this plan the physicians practice on a fee-for-service basis. The bill of the physician is rendered on a card and forwarded to the corporation. The subscribers make a regular monthly payment to the corporation from which source physicians' and other charges are paid. For most illnesses the usual economic barrier between patient and physician has been removed.

There are, of course, the customary exceptions. The WMS does not provide for drugs, appliances, or cosmetic surgery, the treatment of acute syphilis, institutionalized sickness, e.g., mental illness, chronic illness within the first six months, or confinements within the first 10 months of enrollment, or of those illnesses which are the special province of established governmental agencies, such as pensionable illness in veterans. Otherwise the subscriber has available full diagnostic, therapeutic, and surgical services.

All physicians in good standing in the area are free to become member physicians and the vast majority do. While the subscriber utilizes the services of WMS member doctors, he enjoys what is, in effect, a service benefit plan. If he obtains the services of a nonmember physician, the payment from the plan goes to him personally and he enjoys a cash benefit plan. Because of the extensive physician participation the number of subscribers in the latter category is insignificant, but subscribers may utilize this arrangement while on trips or during their summer vacations. However, the same morbidity data are available for study regardless of the membership status of the attending doctor.

Enrollment is open to all citizens who meet the following requirements *: They

* Effective May 1, 1953, WMS made certain changes in their agreement with respect to enrollment, waiting periods, etc., which are not reflected in this paper.

must be employed in one of four specified counties; enroll in groups of 15 or more persons, or as 75 per cent of the total working force of an organizational unit (whichever is the greater). If dependents are included by a worker then he must include all those below 60 years of age. In 1951 there were 95,000 subscribers in the scheme, more than half the population of Windsor being covered by WMS. Since the scheme is made up chiefly of employed groups, it represents a higher proportion of workers than would a random sample from the city.

Recording Morbidity

Each illness is recorded on a Hollerith card by the physician at the termination of the treatment or at the end of the calendar month. In this way the WMS receives one Hollerith card per illness per doctor per subscriber per month, and the present study was made by an analysis of these cards. The items of information provided on the card are coded, key punched, and are thus available for machine analysis. These items are listed as shown here. Although

Information Punched on Hollerith Card

1. Name
2. Month and year of service
3. Year of birth
4. Subscriber number
5. Group number (place of employment)
6. Sex
7. Marital status
8. County
9. Diagnosis (using International three-digit code)
10. Operative code
11. Special service code
12. Doctor number
13. Doctor's county
14. Number of calls
15. Fees

considerable information is available for the patients, no comparable data, other than age and sex, could be obtained for the base population of subscribers. This places a decided limitation on the refinement of the analysis.

The study was based upon the total illness experience for the three separate calendar months of February, 1949, and of January and July, 1951. The first month was arbitrarily chosen for a pilot study, while the latter two were selected to provide for a seasonal contrast and to relate the subscriber population to the 1951 census.

The total experience rather than a sample was used as it involved minimal disruption of the WMS office routine, an important consideration in the early stages of a study such as this, where the immediate practical value is not apparent.

Since the date of first visit to a physician was not available, we measured illness in terms of monthly prevalence. It is clear that the difference between incidence and prevalence rates is a function of duration of illness. For example, with chronic heart disease the difference will be large, while with acute bronchitis it can be very small. Caution, therefore, must be exercised in the comparison of studies using the two different measurements.

Definition of Terms

In the analysis of our results it has been found necessary to adopt certain arbitrary definitions, as given below.

Definition of Terms

1. Subscribers—Persons entitled to medical care under the scheme, both the workers who enroll and their included dependents.
2. Illness—Any morbid condition which has

Mr. Smiley, Dr. Buck, and Dr. Hobbs are associated with the Faculty of Medicine, University of Western Ontario, London, Ontario, Canada, and Dr. Anderson is with the Health Information Foundation, New York, N. Y. This paper was presented before a Joint Session of the Biometrics Society and the Statistics Section of the American Public Health Association at the Eighty-first Annual Meeting in New York, N. Y., November 10, 1953.

caused the subscriber to seek medical services, and for which the WMS has been billed. Further, a single illness is suffered by a patient when the recorded diagnoses fall within clinically related subsections of the Sixth Revision of the International Statistical Classification of Diseases, Injuries and Causes of Death.

3. Monthly Prevalence Rate—The number of illnesses treated during a month per unit of subscriber population regardless of whether or not the illness began in that month.

The preventive services have not been considered in this paper so that our attention will be limited to illness as defined. The determination of a single illness was difficult. Since the periods of observation were limited to one month, it was believed that the probability was very great that cards for one patient bearing a series of diagnoses so related as to fall within clinically similar subsections of the International List would usually be the result of a single illness diagnosed somewhat differently by several doctors or the result of improved diagnosis by a single physician.

At this point it should be noted that of multiple diagnoses recorded by a physician on one card, only the first diagnosis was coded unless it was quite obvious that services were rendered specifically for the succeeding diagnoses. Multiple diagnoses of this type formed 7 per cent of the total illnesses. This point raises the interesting argument as to what constitutes the chief illness if more than one be treated or observed simultaneously by the physician. One could choose the illness which, from the patient's point of view, brought him to the doctor or the illness considered most serious by the doctor. The former serves best the needs of an administrative analysis of demand for service, while the latter serves best the medical analysis of illness. Neither is wholly right, and in our study both types of selection have been met.

As a final note, a number of physicians were given to stating a procedure without diagnosis. Thus, for the designation, "x-ray skull," we assumed that some specific clinical condition not known to us was present and therefore the card was coded as an illness in the section, "unknown illnesses." Occasionally, where the patient had received services from other physicians, it was quite apparent why the "x-ray skull" had been taken, in which case the card bearing this cryptic statement was coded with the apparent diagnosis.

Description of the Subscriber Population

In Tables 1(a) and 1(b) the age and sex distribution of the Windsor City

Table 1(a)—Percentage Distribution of Population by Age and Sex, Windsor and WMS Subscribers

Age Group	Windsor City Census, 1951		Windsor Medical Services Subscribers January, 1951		Windsor Medical Services Subscribers July, 1951	
	Male	Female	Male	Female	Male	Female
0– 9	9.5	9.2	11.8	11.3	12.3	11.9
10–19	6.8	7.1	7.0	7.1	7.0	7.2
20–29	8.8	8.9	9.7	10.6	9.8	10.6
30–39	7.2	7.3	8.4	8.2	8.2	8.0
40–49	6.7	6.2	6.8	5.9	6.6	5.7
50–59	6.2	5.3	5.0	4.0	4.9	3.9
60 +	5.2	5.4	2.5	1.6	2.4	1.5
Unstated	..	..	..	..	..	..
All ages	50.6	49.4	51.2	48.8	51.1	48.9
All ages both sexes	100.0		100.0		100.0	

Table 1(b)—Absolute Distribution of Population by Age and Sex, Windsor and WMS Subscribers

Age Group	Windsor City Census, 1951		Windsor Medical Services Subscribers January, 1951		July, 1951	
	Male	Female	Male	Female	Male	Female
0– 1	6,637	6,341	1,238	1,206	2,030	2,002
1– 4			4,709	4,535	5,091	4,921
5– 9	4,812	4,745	4,205	4,020	4,505	4,324
10–14	4,207	4,135	3,149	3,118	3,394	3,344
15–19	4,007	4,364	2,916	3,014	3,266	3,494
20–29	10,591	10,658	8,322	9,136	9,256	10,072
30–39	8,645	8,815	7,188	7,026	7,806	7,575
40–49	8,080	7,450	5,843	5,070	6,250	5,432
50–59	7,433	6,382	4,345	3,455	4,608	3,709
60 +	6,287	6,460	2,146	1,395	2,251	1,442
Unstated	..	..	19	19	23	21
All ages	60,699	59,350	44,080	41,994	48,480	46,336
All ages both sexes	120,049		86,074		94,816	

population * is compared with that of the WMS subscribers for the months of January and July. Due to the method of enrollment the subscriber population is under-represented in persons over 50 years of age, and particularly in those over 60. It is over-represented in young children, in males 30–49, and in females 20–39, as compared with the Windsor population. Since the subscribers are voluntary, they may not be typical of the general population in such other variables related to morbidity as occupation or income. Thus, WMS cannot be treated as a truly representative sample of the general population. In all studies of this type, where subscribers to prepaid medical care plans are typical only of themselves, generalizations, in the main, must be restricted to them. Elsewhere great caution must be observed in the use of their experience for prediction.

Morbidity Experience of Subscribers

The total prevalence rate for all subscribers was 185 per 1,000 in January and 172 in July (a fall of 7 per cent). Since the monthly prevalence rate is a measure rarely used on this continent, few comparisons can be made with other studies. Brooke's [7] household survey in England shows a monthly prevalence in July, 1947, of 530 illnesses per 1,000 males and 620 for females. These rates are three times as great as ours, but they include illnesses not seen by physicians. Service utilization, however, is similar. Our physician consultation rates * were 27 calls per 100 males and 37 per 100 females, as compared with Brooke's rates of 32 and 35, respectively. Thus, it is possible that as little as one-third of all illness among WMS subscribers is seen by physicians. This is in contrast to the finding of the CCMC † [1, 8] where 75 per cent of the reported illness in a general population had been treated by medical practitioners.‡ This question of the relation between illness treated by physicians and total illness reported by individuals is still an unsettled one.

* Census of Canada, 1951.

* Physician consultation rates exceed illness rates, since some illnesses involve more than one contact with the physician.

† Committee on the Costs of Medical Care, Office of Statistical Investigations, U. S. Public Health Service.

‡ This per cent is calculated from the two references cited.

Table 2—Age-Sex Specific Monthly Prevalence Rates of Illness per 1,000 WMS Subscribers

Age Group	January, 1951		July, 1951	
	Male	Female	Male	Female
Under 1	369	284	269	219
1– 4	168	161	197	176
5– 9	142	131	158	147
10–14	108	121	138	126
15–19	109	169	107	157
20–29	130	213	123	198
30–39	146	223	119	203
40–49	168	275	146	233
50–59	223	297	172	249
60 +	235	290	207	277
All ages	161	210	151	195
All ages both sexes	185		172	

Undoubtedly, the proportion will be influenced by the duration of the survey, since, with chronic illnesses receiving only intermittent medical care, a period of one month may not yield a visit to the physician. This whole problem has recently been investigated and discussed at length by Stein and Sklaroff [9] in Britain.

The variations found in morbidity prevalence rates with age and sex are shown in Table 2. They are compared with three other studies in Figure 1. Since January and July were similar in their age sex trends, only January is shown in Figure 1. All four curves were plotted on three-cycle semilogarithmic paper with a standard age scale and arranged without reference to the frequency levels. There is a noticeable similarity in the age and sex trends of the morbidity rates between the WMS, the CCMC,[1] and the Permanente,[5] in spite of the very different nature of their measures of illness. Both the CCMC and our rates show a fairly sharp decline from infancy to adolescence with a slight male excess in these age groups. Beyond adolescence there is a moderate increase with age and a consistent female excess. For the WMS subscribers the minimum rate occurs at an earlier age in both sexes than in the other two studies. The Permanente data, with its very broad age groups, serves mainly to illustrate the sex reversal after adolescence. Woolsey's [2] study exhibits the same pattern as the others up to age group 20–39 and then differs markedly with its steep rise with age and its marked male excess. A possible explanation of this sex difference arises from the emphasis placed upon inability to work in defining illness in his study. One would expect a male excess here in so far as work disability is more obvious in the case of a man when he stays home from his job than in the case of his wife when she merely reduces the extent of her housework. This idea is supported by Woolsey's observation that rates for unmarried women approached more closely the male pattern. The steeper rise in rates with age noted in Woolsey's study may well be related to the fact that chronic illnesses, known to be more frequent among the elderly, will have a higher probability of being included than will acute illnesses when measuring on the basis of point prevalence.

On the whole, then, it appears that a characteristic age and sex pattern of morbidity emerges, regardless of dif-

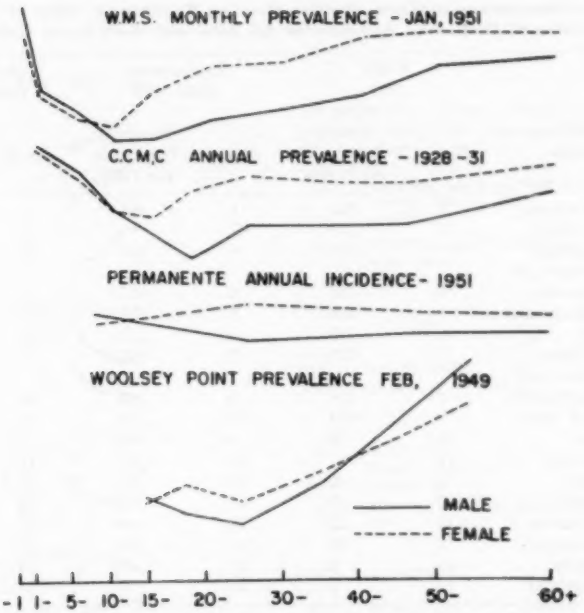
W.M.S. MONTHLY PREVALENCE - JAN, 1951
C.C.M.C ANNUAL PREVALENCE - 1928-31
PERMANENTE ANNUAL INCIDENCE - 1951
WOOLSEY POINT PREVALENCE FEB, 1949
MALE
FEMALE
-1 1- 5- 10- 15- 20- 30- 40- 50- 60+

Figure 1—Age-sex-specific illness rates for certain morbidity studies

ferences in method of measurement, if the period of observation is sufficiently long and the definition of illness a broad one.

The moderate decrease in the over-all prevalence rate noted from January to July is caused by a significant decrease for infants and adults which overbalances a significant increase for children.

Table 3 shows the relative importance of the 17 major diagnostic sections in terms of the ranking of their rates for all ages and both sexes. Comparison is made with the data of the Permanente Plan [5] and the Swift Current Health Region,[6] both of which use the International Statistical Classification [10] and are based upon physicians' services. With the exception of digestive diseases for Permanente, all three are in agreement as to the four most important diagnostic groups and, without exception, are in agreement as to the first 10. Respiratory diseases rank low in Saskatchewan; accidents rank high in the Permanente; and genitourinary diseases rank high in the WMS. The relative importance of "ill-defined" illnesses in each of these studies indicates the frequency with which symptoms instead of diagnoses occur in medical records.

For the sake of brevity, the detailed analyses of the age-sex trends for each section of the International List will not be described.* It is possible, however, to summarize briefly the outstanding features common to both months.

Several basic age trends can be recognized. These are shown in Figure 2. The first of these trends, a rise in rates with age, can be further divided into three patterns: circulatory, bone,

* Full tables available on request.

Table 3—Comparison of Three Studies Showing Ranking of Rates of Illness by International Diagnostic Sections for All Ages and Both Sexes Combined

International Diagnostic Sections	WMS 1951 Rank	WMS 1951 Mean * Monthly Prevalence per 10,000	Permanente 1949–1950 Rank	Permanente 1949–1950 Annual † Prevalence per 1,000	Swift Current Health Region 1949 Rank	Swift Current Health Region 1949 Annual Incidence per 1,000
VIII. Respiratory	1	381	1	298	1	174
IX. Digestive	2	179	7	91	4	111
XVI. Ill-Defined	3	(173)	4	124	2	145
VI. Nervous and Sensory	4	162	3	151	3	127
X. Genitourinary	5	144	8	73	9	36
XII. Skin	6	138	5	115	8	44
XVII. Accidents	7	126	2	157	6	61
III. Allergic and Endocrine	8	114	6	98	10	26
VII. Circulatory	9	104	10	56	5	92
XIII. Bone	10	78	9	67	7	59
I. Infective	11	57	12	47	12.5	18
IV. Blood	12	46	16	5	12.5	18
V. Mental	13	33	11	51	14	6
II. Neoplasms	14	23	14	30	11	19
XI. Puerperal	15	19	13	38	15	5
XV. Infancy	16	2	17	1	16.5	1
XIV. Congenital	17	2	15	7	16.5	1

* Mean rate of January and July, 1951

† Calculated from data given in reference No. 5

The figure in parenthesis represents the combination of unknown illnesses with the Section Ill-Defined

and blood diseases all show a steady increase with age (except for blood diseases in males); mental diseases and allergic and endocrine disorders in females show a rise in rates early in life without further appreciable change with age; and rates for allergic and endocrine disorders in males do not rise until late adult life.

The second basic age trend is that of a fall with age in which two patterns are detectable: rates for the infective diseases fall steadily throughout life, while rates for respiratory and skin diseases cease to fall after childhood, remaining essentially level thereafter. These conditions, on the whole, are acute in nature, in contrast to those which rise with age which are essentially chronic illnesses.

High rates at the extremes of life: several illness groups have this age pattern, namely, neoplasms, digestive diseases and, in males, blood and genitourinary diseases. It is obvious that this pattern can arise when illnesses of very different etiology are included in the same International Section. As an extreme example, we have the genitourinary disorders among male infants which, being related to circumcision, have little in common with the genitourinary diseases of later life.

Other changes with age: finally we are left with three illness groups which have none of the age patterns already described—accidents show a rise in rates to a peak in childhood with a moderate decrease thereafter; diseases of the genitourinary system in females show a rise in rates to a peak in middle life with a subsequent fall; nervous and sensory diseases had little or no change in rates with age.

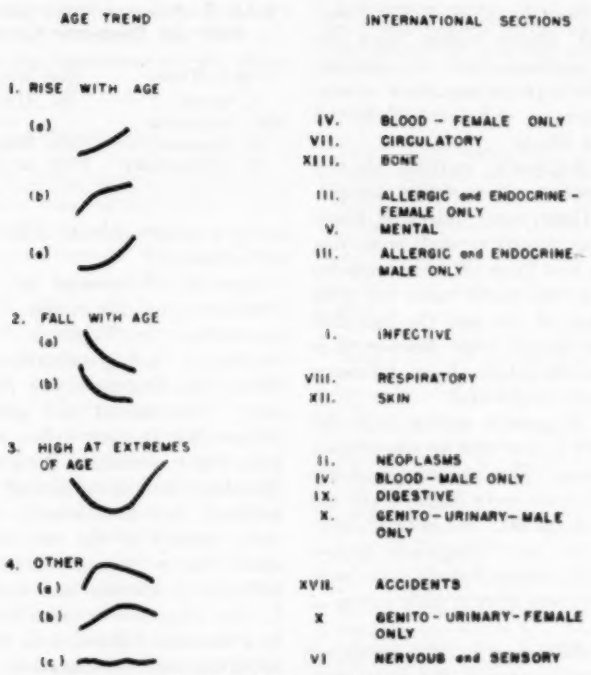

Figure 2—Age trends in morbidity by diagnosis

Sex differences in rates: again several basic categories may be recognized. (These are summarized in Table 4.) Female rates exceed the male for neoplasms, allergic and endocrine disorders, blood, mental, and genitourinary diseases. A much less marked female excess than for the above was noted in nervous and sensory and in circulatory diseases. For many of these diagnoses the female excess did not appear until after childhood, reached its peak in the mid-adult years, and diminished toward the older ages. The possible significance of this gives rise to interesting speculation. Does this mean that once childhood is passed and she is responsible for her own health, that the female seeks medical care earlier and more often than does the male? The fact that similar female ex-

Table 4—Sex Difference in Morbidity by Diagnosis

Nature of Sex Difference	International Sections
1. Female Excess	
(a) Marked	II. Neoplasms
	III. Allergic and Endocrine
	IV. Blood
	V. Mental
	X. Genitourinary
(b) Moderate	VI. Nervous and Sensory
	VII. Circulatory
2. Inconsistent or absent	I. Infective
	VIII. Respiratory
	IX. Digestive
	XII. Skin
	XIII. Bone
3. Male Excess	XVII. Accidents

cesses have been found in studies based on reported illness rather than on physicians' services does not entirely rule out this explanation, since a subjective element is still involved in the definition of illness.

Several diagnostic sections showed either minimal or inconsistent sex differences. These were: infective, respiratory, skin, digestive, and bone diseases. The first three of these comprise the illness group whose rates fell with age. Because of this and the fact that they include mainly acute illnesses, it is possible that their lack of sex difference is more than coincidental.

For one diagnostic section only did we encounter a clear and persistent male excess in rates. This was for accidents, where male rates were higher than the female up to age 40. We noticed, however, that for many diagnostic groups where, on the whole, female rates were higher, there was often a male excess at ages 0–4.

The sex differences in rates which we have observed agree in the main with the findings of other workers. In the CCMC household morbidity survey [11] the sex ratios of illness rates for the various diagnostic groups reveal a very similar pattern. Sydenstricker [3] found in his Hagerstown survey, as we did here, that excess male rates are apt to occur in early childhood for many illnesses even where the female rates are consistently higher at other ages.

Brief mention may be made here of the contrast between sex differences in morbidity and mortality. Comparing our morbidity data with Canadian mortality rates for 1949, it has been noted that the position of the female with respect to the male is more favorable for mortality than for morbidity. For diagnoses where the female morbidity rates are in excess, their mortality rates show either a much smaller excess or a deficit. In the case of accidents, where there is a female deficit in morbidity, an even greater female deficit is found in mortality.

Table 5—Seasonal Differences in Morbidity by Diagnostic Categories

High in Winter	High in Summer
V. Mental	III. Allergic and Endocrine
VIII. Respiratory	XII. Skin
IX. Digestive	XVII. Accidents
X. Genitourinary	

Seasonal Differences in Morbidity Prevalence by Diagnosis: (These are summarized in Table 5.)* Mental, respiratory, and genitourinary diseases showed significantly higher rates in January. For mental and genitourinary diseases the January excess was principally due to females. With respiratory disorders, both sexes and all ages were involved, but the January excess was more marked at the two extremes of age. This is probably a real seasonal difference; whereas the winter excess for the other two is more likely related to a seasonal difference in readiness to undertake medical treatment. We found that for digestive diseases the over-all rate was also significantly higher in winter. Despite this, however, the infant age group showed a significantly higher rate in summer which in all likelihood represents an increase in infectious enteritis.

Three diagnostic sections showed significantly higher rates in July. These were allergic and endocrine diseases, skin diseases, and accidents. For allergic and endocrine diseases the July excess arose from the female rates. For accidents it arose principally from the rates for children and for skin diseases from the rates for male children. There is reason to believe that these increases may represent a true seasonal change in prevalence related to the summer environment and vacation pursuits. It is realized, of course, that seasonal

* All changes referred to were supported by the February data.

changes other than those described may very well have occurred, but were obscured by the broadness of the diagnostic classification.

Summary and Conclusions

In the foregoing analysis of the morbidity rates among subscribers to a prepaid medical care plan we have noted certain general trends with age, sex, diagnosis, and season. Except for the influence of season which has not been investigated extensively by others, it can be said that these trends conform to those which have emerged from other studies using different sources of morbidity data. It seems, therefore, that in some respects physicians' services to an insured population give a representative picture of total morbidity. To what extent this is true when such other variables as occupation, place of residence, and income are considered is a matter requiring further study.

It is felt that the determination of the relationships between illness existing in the population and illness treated by physicians is a problem of general interest to preventive medicine quite apart from its implications for medical economics.

ACKNOWLEDGMENTS — This study was supported by a National Health Grant (Canada). We acknowledge with gratitude the constant cooperation of J. A. Boyle, Dr. J. W. Merritt, and W. V. Walpole of the Windsor Medical Services Inc.

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A COMMITTEE REPORT

Proposed Report of the Committee on Administrative Practice on Interstate Acceptance of Milk

Draft of a proposed statement of the Committee on Administrative Practice of the American Public Health Association which is published for the information of Fellows and members and in order to promote discussion.

✣ In order to facilitate the interchange of milk between cities and states and in order to reduce the costs to the public in money and effort of procurement of protection, the following principles and procedures are recommended by the Committee on Administrative Practice of the American Public Health Association.

In making these recommendations the Committee on Administrative Practice endorses the principle of acceptance by a health authority of sources of milk supplies from areas beyond the limits of its routine inspection on the basis of certification by another acceptable milk control agency. This endorsement is based on the voluntary acceptance of this principle by any receiving health authority.

It is recommended that:

1. Recognition be given to the acceptance, on the basis of certification, of milk supplies that are under the full-time supervision of a municipal, county, or state agency.
2. Actual certification be made by a designated state rating officer of the shipping state.
3. The source of supply be under routine laboratory control approved by the shipping state and in conformance with APHA Standard Methods for the Examination of Dairy Products.
4. The U. S. Public Health Service Milk Ordinance and Code or its equivalent be used as the basis for rating milk supplies.
5. The rating procedure used be that outlined in the U. S. Public Health Service recommended Milk Sanitation Rating Method.
6. The U. S. Public Health Service make check ratings on a periodic basis, and, in addition upon request, for purposes of verification of the ratings and laboratory procedures of the shipping state.
7. The shipping state reports results of ratings to the U. S. Public Health Service for publication and dissemination. The receiving state reports to the shipping state and to the U. S. Public Health Service instances in which any question of sanitary quality is involved.

Milk supplies of cities, historically, have been drawn from the immediately surrounding area; in larger cities the supply is drawn from what has come to be known as milksheds. The supply of milk in given sheds is subject to variation, due to biological and natural forces. The demand for milk in cities varies considerably over the seasons and generally not paralleling the periods of production. In order that the milk supply may be augmented in periods when shortages occur, additional quantities in the form of fluid milk or cream have been procured in distant areas, sometimes referred to as surplus areas.

The milk supply of individual cities has been and is subject to official health department supervision. Because of varying local conditions, the requirements nominally established in the different public health regulations have developed separately and thus often

differ considerably. They have not developed in a uniform manner.

Intensification of the need for supplementary milk sources in certain areas has developed for a number of reasons: Population numbers have increased tremendously in virtually all major areas. Small communities have become significant towns and cities. Increased use of milk has resulted because of better knowledge of nutrition. In many areas milk supply or producing facilities have decreased because of fewer dairy farms, loss of young people to urban employment, land utilization, and other factors. As a result, contiguous towns and cities, and even states, now often procure milk from the same general milkshed or sheds. Supplementary supplies are procured either periodically or regularly from extended milksheds or distant areas. In the procurement of such milk there are frequently exercised different regulatory interpretations, procedures, and requirements in the light of existing regulations. Lack of uniform approach in the procedures has resulted in a confusing situation. Officials of receiving areas, to secure milk supplies, have made inspections of dairy farms and plants in the producing areas. Producing areas have found it confusing and costly when subject to multiple inspections. In complying with the requirements of one market producing areas frequently must violate those of another. Situations of this sort have discouraged producing sections of the country from undertaking the financial responsibilities in anticipation of new markets. Milk-receiving areas, on the other hand, have relatively fewer sources of supply upon which to draw to economical advantage. The expenditure of duplicating effort, costly in itself, limits the potential utilization of personnel on other important health problems. With growing population problems the availability of regular and seasonal supplies at low cost and reasonable effort is increasingly important if milk consumption for health is to be maintained.

The committee recognizes that the principles in this report are substantially in accord with the objectives of the National Conference on Interstate Milk Shipments. The committee supports the program of the conference and urges greater participation therein by state and local health jurisdictions. The Annual Conference of the State and Territorial Health Officers has long advocated the development of a cooperative program for the interstate acceptance of milk.

This statement was prepared by the Subcommittee on the Interstate Acceptance of Milk of the Committee on Administrative Practice.

C. W. Klassen, Chairman
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K. G. Weckel, Ph.D.
Huntington Williams, M.D.

A COMMITTEE REPORT

Proposed Report on Educational and Experience Qualifications of Physical Therapists in Public Health Agencies*†

This is a provisional report published at the request of the Committee on Professional Education of the American Public Health Association before transmittal to the Governing Council in order to permit the members and Fellows of the Association to review it and to offer criticism and suggestions. All comments will be carefully weighed by the Committee on Professional Education and accepted changes will be incorporated in the report before presentation to the Governing Council for action. Address comments to: Secretary, Committee on Professional Education, American Public Health Association, 1790 Broadway, New York 19, N. Y.

I. GENERAL SCOPE OF THE FIELD

✣ Physical therapy is an integral part of health and medical care programs. Services given by physical therapists in public health agencies include: direct service to patients; teaching individuals and groups; consultation with other professional workers and organizations; and planning for physical therapy services on a city, county, state, and nationwide basis. These activities are carried out in continuous association with the agency administering the health services and with allied organizations. Through these services physical therapists contribute to the rehabilitation of individuals handicapped by injury or disease, the prevention of deformity and motor disabilities, and the maintenance of health.

All direct treatment of patients is given upon medical prescription and direction of a qualified physician who may be an orthopedist, a pediatrician, neurosurgeon, physiatrist, internist, surgeon, or general practitioner. Examples of physical therapy procedures which may be prescribed are the use of heat, light, water, massage, muscle stimulation, electric and manual testing, and therapeutic exercises, including gait training and instruction in other functional activities which will aid in physical independence. Physical therapy service to patients includes not only administration of physical therapy procedures but "therapeutic teaching" since treatment can be more effective in a shorter time if the patient and family understand the purpose and plan of treatment and ways in which they can assist. They need specific instruction in details such as technics of muscle re-education, care and use of braces or prosthetic devices, and the amount and

* This report, like all other statements of the committee on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

† Prepared in consultation with the Referee by the Committee on Educational and Experience Qualifications of Physical Therapists in Public Health Agencies of the American Physical Therapy Association, and approved by the Executive Committee of that association. The members of the committee included: Clara Arrington, chairman, Mary Macdonald, Priscilla Chandler, Sarah Johnson, and Jessie Stevenson West.

type of activity which will help promote maximum recovery.

Physical therapy in the public health field had its beginning in 1915 when the first physical therapist was employed by the Vermont State Health Department to administer treatment to poliomyelitis patients in their homes. Physical therapy in this country was established as a profession following World War I, which focused attention on the value of a physical therapy in the rehabilitation of those disabled by war injuries. During the period 1920–1936 a limited number of physical therapists were employed for home care in nonofficial agencies, such as visiting nurse associations and societies for crippled children, and in state agencies for crippled children.

The demand for physical therapy in health agencies is growing steadily and rapidly and exceeds the supply of qualified therapists. For this reason the contribution of physical therapists in planning distribution of services and effective use of available personnel is especially important. The most rapid growth in demands for physical therapy in public health agencies has come since 1936 — especially in the last decade. Some of the factors which have influenced this growth are:

1. Widespread expansion of state agencies for crippled children because of federal funds made available through the Social Security Act.
2. Advances in medical knowledge which have made it possible to treat and retrain many persons who formerly had no favorable outlook for resuming their activities. Laboratory and clinical research have established the value of physical therapy in the treatment of a wide variety of conditions such as anterior poliomyelitis, cerebral palsy, multiple sclerosis, peripheral nerve injuries, nontuberculous and tuberculous chest conditions, amputations, paraplegia, fractures, arthritis and many other conditions.
3. Growing awareness of the problems of the chronically ill and the handicapped and rapid development of programs for their medical care and rehabilitation. The incidence of chronic disability and disease can be expected to increase as the average age of the population continues to advance.
4. The increased incidence of poliomyelitis within the past ten years.
5. Educational programs in allied professions which have resulted in greater demand for teaching and consultant services of physical therapists.

In health and medical care programs under public and voluntary auspices physical therapists serve as consultants to the administrator and other professional personnel. They may serve as supervisors of areas or in staff positions, rendering direct service to patients, instructing families in procedures to be carried out in the home and working with other professional members of the health agency. The majority of physical therapists in public health agencies are employed in staff positions. Accurate information as to the number of consultant, supervisory, and staff positions in public health programs is not available. It is estimated that 10 per cent of the 5,000 practicing physical therapists are employed in public health agencies, exclusive of positions in hospitals, clinics, and other medical institutions. The largest number are on the staffs of official state, county and city health agencies, and other official agencies administering crippled children's services under the Social Security Act. The next largest group is employed by visiting nurse associations. Qualifications established for these positions require completion of a course in physical therapy approved by the Council on Medical Education and Hospitals of the American Medical Association, plus experience in physical therapy.

In 1921 the American Physical Therapy Association was established as the professional organization of qualified physical therapists. The purpose of the association is to promote the development of physical therapy as a service and a profession. The basis of eli-

gibility to full membership is graduation from a physical therapy school or course approved by the Council on Medical Education and Hospitals of the American Medical Association. Physical therapists trained in certain foreign countries may be awarded full membership upon successful completion of one year's approved supervised employment in this country and passing an examination given by the association. Members must adhere to the official code of ethics of the association and comply with legal requirements for state registration or licensure.

II. STATEMENT OF FUNCTIONS

A. Duties Performed at Present:

The functions of physical therapists have been drawn up with the following factors in mind:

1. The duties and responsibilities pertaining to direct service to the patient will be carried ont only with medical approval and direction.
2. The duties and responsibilities which relate to teaching, consultation, and administration may be developed in association with the physician who may be the medical director or a member of the medical advisory committee of the agency; and with other professional workers concerned in the total program.
3. The activities of the physical therapist shall be in accord with the administrative policies of the employing agency.
4. Since there are variations in the types of agencies conducting public health programs, as well as in the scope of such programs, all the suggested functions of physical therapists will not necessarily be applicable to all agencies.

The activities will include most, if not all, of the following:

1. Service to Patients

a. Apply physical therapy procedures and diagnostic tests to patients for whom these have been medically prescribed, including:
   (1) Teaching physical therapy procedures to a patient or family member, or both, with oral or written directions
   (2) Instructing patients or family member, or both, in supportive activities to be carried out in between visits
   (3) Conferring periodically with the attending physician regarding the patient's progress

b. Attend clinics for the purpose of:
   (1) Receiving medical direction for physical therapy care
   (2) Giving direct service including individual and group teaching when indicated to patients attending clinic
   (3) Participating in pre- and postclinic conferences

c. Promote in every way possible:
   (1) The early recognition of suspected congenital deformities
   (2) The recognition and prevention of acquired disabilities
   (3) The prompt referral of patients with these disabilities for medical care
   (4) Acceptable principles and practices of physical therapy in the care of orthopedic and other conditions

d. Be aware of physical, emotional, and socioeconomic problems affecting the health of each patient and his family; report and confer with responsible administrative personnel on such problems.

e. Demonstrate physical therapy procedures and supportive activities on selected patients to the nurse responsible for follow-up nursing service to the family.

f. Utilize community resources for the care of the patient.

2. Consultation

a. Provide advisory service to other professional workers who share responsibility for patient care.

b. Consult with nurses regarding the program of care in which the parents have been instructed and on general supportive activities to be followed at home or in school.

c. Render consultation on request from hospitals, departments of education, and other organizations regarding planning of physical therapy departments, including recommendations on equipment, staff, personnel policies, and interdepartmental relationships.

d. Seek consultation from other professional workers when indicated.

3. Records and Reports

Develop, promote, and maintain a system for:

(1) Adequate recording of information which will indicate the progress of patients receiving care or supervision from physical therapy personnel and factors which may influence or modify the prescribed program of care

(2) Relaying pertinent physical therapy data to medical, nursing, and other professional personnel

4. Staff Education

a. Participate in staff education programs within the agency, including the orientation of other workers to the aims and objectives of physical therapy and, on request, to advise staff members regarding personal problems of body mechanics relative to daily activities.

b. Demonstrate and supervise treatment given by physical therapy students or new staff members, or both; assist in the evaluation of such students and new staff; suggest ways and means of improving student field experience and the orientation of new physical therapists to the agency.

c. Assemble, evaluate, and prepare educational material for use in teaching and advisory service.

5. Community Planning

a. Participate in the development of community resources to meet the needs of the patient.

b. Participate in the development of acceptable standards for treatment of children and adults in clinics, hospitals, schools, rehabilitation centers, and in the home.

c. Interpret the physical therapy program of the agency to the community.

6. Administration

Plan physical therapy services in the agency including:

(1) Organization of physical therapy services

(2) Assistance to the agency administration in the formulation of physical therapy policies

(3) Allocation of physical therapists to meet the needs of the agency program

(4) Analysis of achievements and unmet needs

7. Professional Responsibilities

a. Attend and participate in professional activities of physical therapy and allied organizations.

b. Interpret physical therapy as a service and as a profession.

c. Assist in recruitment of students for schools of physical therapy.

d. Continue education through reading and study of recent trends and developments in physical therapy and public health.

B. Types of Positions—Classification of Grades:

Physical therapy positions in health agencies show a variety of responsibilities and differences in classification of work positions. In general, the positions are on three levels:

1. **Chief Consultant** or **Supervisor** is responsible for planning, organizing, and directing a program of physical therapy services; development of standards for personnel selection and performance.
2. **District or Area Consultant** or **Supervisor** is responsible for supervision of staff physical therapists in the district or area; develops services in clinics, home, field, and hospital; furnishes consultation within the area of assignment; integrates the Physical Therapy Program with other services; liaison between the chief consultant or supervisor and physical therapy staff; provides direct service to patients.
3. **Staff Physical Therapist** is responsible for the provision of physical therapy services to patients, and related work as assigned.

III. EDUCATIONAL PREPARATION OF PHYSICAL THERAPISTS

The Council on Medical Education and Hospitals of the American Medical Association is the approving body for curricula in physical therapy. These programs must be established in colleges and universities accredited by the Regional Associations of Colleges and Secondary Schools and associated with medical schools approved by the Council on Medical Education and Hospitals or teaching hospitals approved by the Joint Commission on Accreditation of Hospitals.

Approved professional preparation may be obtained in one of two ways:

(1) A four-year program leading to a baccalaureate degree with a major in physical therapy. Students with advanced standing may transfer into most of these programs not later than the beginning of the junior year;

(2) An undergraduate degree in another field of concentration, fulfilling requirements in the humanities, social studies, biological and physical sciences, plus a one- to two-year program granting a certificate in physical therapy.

Essentially, the curriculum is divided into four fairly equal areas combining a broad liberal arts and professional education:

(1) Humanities and Social Studies

This area of the curriculum provides a broad liberal arts program which is essential for professional stature. It offers the student a cultural background; the tools and training for self-expression; a better understanding and appreciation of emotional development; cultural behavior patterns of people under various circumstances; and a basis on which to develop attitudes and a philosophy which will guide him throughout his personal and professional life.

(2) Biological and Physical Sciences

Animal biology, human anatomy and physiology, pathology, physics and chemistry are required courses in the physical therapy curriculum. In the advanced biological science courses, major emphasis is on the anatomy, physiology and pathology of the topographical, skeletal, neuromuscular, and circulatory systems of the human body. In the physical science courses, major emphasis is on the fundamental laws and theories of general chemistry and the principles of mechanics, thermodynamics, light, sound, and electricity. The ultimate objective of this studied sequence of lecture and laboratory work is a sound understanding and correlation of the biological and physical phenomena characteristic of human beings, the principles by which deviations from normal may be analyzed, and the body's reaction to various physical agents and procedures in the prevention or treatment, or both, of abnormal or pathological conditions. This background of understanding is essential for the intelligent practice of physical therapy and gives the physical therapist the theoretical knowledge to exercise judgment to the best interest of the patient.

(3) Physical Therapy Theory and Procedures Related to Clinical Medicine

The technical procedures and devices used in physical therapy are taught in this area of the curriculum and are similar in both the degree and certificate programs. This sequence includes technics in bandaging, asepsis, and isolation; massage; therapeutic exercise, assistive devices, and disability evaluation; thermotherapy, actinotherapy, electrotherapy, and electrical and manual testing. In addition, a series of special lectures and clinical demonstrations are required on diseases and disabilities treated by physical therapy, as represented by all areas of specialization in general medicine and surgery, including public health.

Other courses are included in administration, patient management and professional and community relationships. Studies are made of the physical plant and equipment needs, organization, personnel management, and employment practices. The value, function, and construction of reports and statistical analyses are discussed in relation to public and private institutions, agencies and departments and for recording patient progress. Guidance is given in regard to personal and professional conduct, responsibility of the physical therapist to co-workers, treatment agencies, and the community; and a review is made of the historical development and trends in the field of physical therapy. Finally, all aspects of the curriculum are directed toward the development of concepts of the art and practice of total patient care related to the rehabilitation of the individual in the hospital, in the home, and as a member of the community.

At least 600 clock hours of the curriculum are devoted to directed clinical practice in the hospitals and

outpatient departments. This practice is usually given upon completion of all other aspects of the program and gives the student an opportunity for practical orientation and experience in the job situation.

(4) Unassigned Credit

This area provides opportunity for student's choice of electives and flexibility within the university program. All areas of the curriculum are closely integrated.

IV. SPECIFIC KNOWLEDGE, SKILLS AND EXPERIENCE

The basic educational preparation that is given in schools approved by the Council on Medical Education and Hospitals provides the basic knowledge and skills required to treat patients. In addition, one year of supervised physical therapy experience following graduation from an approved school is essential to prepare a person for employment in a public health agency on the staff level. This experience must be under a physical therapist who is a graduate of an approved school with at least two years of physical therapy experience. The employment may be in a hospital or clinic which serves outpatients or assignment to a service within the agency which can provide close physical therapy supervision. The employing agency has the responsibility for orienting each new worker to the agency's philosophy and administrative procedures. The new worker must also have assistance in adapting his knowledge, abilities, and skills to the public health setting.

V. QUALIFICATIONS FOR DIFFERENT GRADES

All must have a thorough knowledge of the principles and practice of physical therapy, including a thorough knowledge of skeletal and neuroanatomy.

1. Chief Consultant or Supervisor

A knowledge of basic public health principles; of administration and organization. Must have skill in analysis of situations, in preparation and presentation of material and in transmission of ideas.

Education — Graduation from a school of physical therapy approved by the Council on Medical Education and Hospitals at the time of graduation. Completion of a full graduate curriculum.

Experience — Minimum of three years full-time paid experience in the practice of physical therapy. This experience should include one year in a hospital or clinic under the supervision of a qualified physical therapist; two years in a supervisory capacity, one year of which should be in a hospital, clinic, or public health facility serving outpatients and maintaining acceptable standards. In certain agencies it would be desirable to have a year of experience in the specialty of the employing agency, such as arthritis, cerebral palsy, poliomyelitis, multiple sclerosis, orthopedics, crippled children, adults.

Personal Qualities — Ability to supervise and work effectively with others; ability to express oneself clearly and intelligently; ability to establish and maintain constructive working relationships; physical fitness; emotional stability; personal and professional integrity.

2. District or Area Consultant or Supervisor

Physical therapists in this position have responsibility for a limited geographic area, which includes consultation with other health agency personnel, supervision of staff physical therapists, and direct service to patients.

Education — Graduation from a school of physical therapy approved by the Council on Medical Education and Hospitals at the time of graduation.

Experience — Minimum of two years full-time paid experience in the

practice of physical therapy. This experience should include one year in a hospital or clinic under the supervision of a qualified physical therapist; and one year of experience which has included some supervisory or administrative responsibilities.

Personal Qualities — Ability to supervise and work effectively with others; ability to express oneself clearly and intelligibly; ability to establish and maintain constructive working relationships; potential abilities in organization and administration of physical therapy services; ability to administer physical therapy procedures and tests; physical fitness; emotional stability; personal and professional integrity.

3. Staff Physical Therapist

The primary responsibility of a physical therapist in this position is to provide direct service to patients under supervision of the area consultant or supervisor. The staff therapist may assume such other responsibilities as are assigned by the supervisor.

Education — Graduation from a school of physical therapy approved by the Council on Medical Education and Hospitals at the time of graduation.

Experience — Minimum of one year full-time paid experience in a hospital or clinic under the supervision of a qualified physical therapist.

Personal Qualities — Ability to administer physical therapy procedures and tests; ability to maintain effective working relationships; ability to observe and report pertinent factors in situations; capacity for professional growth; physical fitness; emotional stability; personal and professional integrity.

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A COMMITTEE REPORT

Water Examinations by Membrane Filter and Most Probable Number Procedures

Report of a Field Study of the Standard Methods Committee for the Examination of Water and Sewage

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✣ The membrane (molecular) filter hereinafter designated as MF was first described in this country by Goetz [1] who discussed its physical and chemical properties and suggested possible applications in the examination of water. In 1951 Clark, et al.,[2] recommended specific methods and materials for use with the membrane filter in sanitary bacteriology. These reports and the results of related investigations [3-6] indicated the desirability of critically comparing the results of water examinations by the MF technic with those obtained simultaneously by the Standard Methods fermentation tube test [7] (MPN procedure).

This report summarizes the results of a field study of the two procedures carried out during the year July 1, 1952–June 30, 1953, under the joint auspices of the American Public Health Association, the American Water Works Association, and the Environmental Health Center of the Public Health Service. The data summarized were provided by the sanitation laboratory services of the California State Department of Public Health, Georgia State Department of Public Health, Indiana State Board of Health, Kansas State Board of Health, Massachusetts State Department of Public Health, New York State Department of Health, Ohio State Department of Health, West Virginia State Department of Health, and the City of Chicago Board of Health. Data pertaining to other phases of the field study and still to be summarized (July 1–November 1, 1953) also include reports from the Texas State Department of Health. Representatives of the participating laboratories received preliminary instruction and experience on the membrane filter procedures in a seminar given April 22–25, 1952, at the Environmental Health Center, Cincinnati. Three of the participating laboratories began examination of samples in July, three in August, and the remainder a month or two thereafter.

Materials and Methods

Period July 1–December 31, 1952

Participating laboratories were requested to collect water samples from selected sources, including both surface and ground waters, and to use as many individual sources as possible. No source was to be re-examined more fre-

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quently than every two months. Sources selected were to show a coliform MPN index between 10 and 200 per 100 ml.

Duplicate 50 ml. portions of each sample were examined by the MF technic described by Clark, et al.,[2] and as discussed at the seminar in Cincinnati preceding the study. A portion of the sample was examined simultaneously by the Standard Methods[7] MPN confirmed test using five tubes from each of three dilutions. Confirmation of all presumptive tubes showing any amount of gas in 24 or 48 hours was made by transfer to brilliant green bile broth. Determinations of color, turbidity, alkalinity, hardness, iron, pH, and oxygen consumed were also completed and reported.

Period January 1–March 31, 1953

Because of some unsatisfactory results due to confluence of microbial growths or excessive accumulations of suspended materials, and in order to incorporate into the study some improvements in technic, the following changes in procedure were requested:

Water samples were to be chosen in approximately equal numbers from raw water sources for public supply, finished waters, and other sources, such as wells, springs, and streams. Volumes of water samples were to be chosen so that at least one membrane had a "total colony" count not to exceed 300–400. Volumes suggested were: finished waters, 100 ml. and 10 ml.; raw waters (wells, springs, polluted streams), 10 ml., 1 ml., and .1 ml.; sewage, .1 ml., .01 ml., and .001 ml., or less. Difco dehydrated "M" enrichment medium[8] was designated an acceptable substitute for Albimi M medium for the enrichment period of incubation. Membrane filter discs were to be sterilized by autoclave instead of by previously stipulated ethylene oxide. A slight modification in the procedure for preparing modified Endo broth was recommended in which 3 ml. of sterile 20 per cent lactose solution and 1.54 ml. of the dye-sulfite mixture were added to each 30 ml. of basal medium.

Period April 1–June 30, 1953

Because the filter membranes for some samples continued to show numerous colonies of noncoliform organisms, a more selectively inhibitory medium for noncoliforms was studied. This medium, "brilliant green fuchsin (BGF)," was the previously described modified Endo to which 0.75 ml. of 1 per cent aqueous brilliant green solution and 0.67 ml. of 95 per cent ethyl alcohol were added per 30 ml. of basal medium. Choice of sample source, volume of sample, etc., remained unchanged. Discontinuation of physical and chemical tests of the samples was recommended.

Results and Discussion

Tables 1, 2, and 3 show the distribution of samples examined as to source and by participating laboratory. Results for each of the three periods, namely, July 1–December 31, 1952; January 1–March 31, 1953; and April 1–June 30, 1953, have been tabulated separately because of the previously described variations in choice of source and volume of samples examined, procedure, and media. It is believed that these factors remained relatively constant during each period of the study. The total number and per cent of samples showing agreement and disagreement of results are also shown in these tables for each water source and each participating laboratory.

The results of the MF and MPN procedures are compared on the basis of the 95 per cent confidence limits of the most probable number. For a determinate five-tube, three-dilution test, the 95 per cent confidence limits are roughly 0.3–2.9 times the calculated MPN.[9] The MF results that fall within these limits are considered in agreement with those of the MPN procedure. The MF results that fall outside these limits are tabulated as in disagreement.

This procedure was adopted rather than a more elaborate one which would consider also the variance of the MF result for two reasons. First, the variance

Table 1—Comparison of MF and MPN Results of Water Sources Examined in the Various Participating Laboratories (July 1–December 31, 1952)

Water Source		Laboratory								Totals				Grand Total
		1	2	3	4	5	6	7	8	Agree * No.	Agree * %	Disagree † No.	Disagree † %	
Well		25	46	46	24	..	26	19	67	176	70	77	30	253
River		15	5	..	47	..	..	26	..	67	72	26	28	93
Surface		18	..	..	30	22	..	1	..	51	72	20	28	71
Stream		4	31	11	..	..	..	1	2	27	51	26	49	53
Spring		2	11	2	2	..	10	3	11	33	80	8	20	41
Lake		3	18	..	5	..	6	5	..	25	68	12	32	37
Creek		2	3	..	8	..	17	4	..	18	53	16	47	34
Reservoir		..	2	..	1	..	30	1	..	25	74	9	26	34
Tap		7	..	..	..	9	..	..	6	16	73	6	27	22
Ground		..	8	..	..	9	..	..	..	10	59	7	41	17
Cistern		..	.	2	..	..	..	..	7	5	56	4	44	9
Pond		..	5	..	..	..	3	..	..	4	50	4	50	8
Sea		3	2	..	..	..	..	..	..	2	40	3	60	5
Pool		..	..	..	..	..	..	..	4	4	100	0	0	4
Filter Effluent		..	1	..	..	..	..	..	..	1	100	0	0	1
TOTAL		83	132	61	117	40	92	60	97					682
	No.	52	81	38	91	25	66	41	70	464				
Agree	%	63	61	62	78	63	72	68	72		68			
	No.	31	51	23	26	15	26	19	27			218		
Disagree	%	37	39	38	22	37	28	32	28				32	

* MF results fall within the 95 per cent confidence limits of the simultaneously determined MPN
† MF results fall outside the 95 per cent confidence limits of the simultaneously determined MPN

Table 2—Comparison of MF and MPN Results of Water Sources Examined in the Various Participating Laboratories (January 1–March 31, 1953)

Water Source		Laboratory								Totals				Grand Total
		1	2	4	5	6	7	8	9	Agree No.	Agree %	Disagree No.	Disagree %	
Well		4	18	36	44	17	39	145	..	244	79	59	21	303
River		11	..	17	3	..	34	15	17	74	76	23	24	97
Surface		4	..	4	4	1	2	..	..	11	73	4	27	15
Stream		..	..	..	..	..	4	1	..	3	60	2	40	5
Spring		1	..	1	1	11	3	31	..	37	77	11	23	48
Lake		..	8	6	3	4	2	..	27	30	60	20	40	50
Creek		..	..	6	..	15	5	..	..	22	85	4	15	26
Reservoir		..	..	10	..	31	1	1	..	38	88	5	12	43
Tap		..	6	14	1	..	..	21	..	42	100	0	0	42
Ground		..	..	..	3	..	..	..	..	2	67	1	33	3
Cistern		..	..	..	..	..	4	6	..	6	60	4	40	10
Pond		..	..	..	..	3	..	3*	..	5	83	1	17	6
Mine		..	..	..	..	..	..	2	..	1	50	1	50	2
TOTAL		20	32	94	59	82	94	225	44					650
	No.	15	25	87	35	69	60	193	31	515				
Agree	%	75	78	93	59	84	64	86	70		79			
	No.	5	7	7	24	13	34	32	13			135		
Disagree	%	25	22	7	41	16	36	14	30				21	

* Swimming pool samples

Table 3—Comparison of MF and MPN Results of Water Sources Examined in the Various Participating Laboratories (April 1–June 30, 1953)

Water Source		Laboratory								Totals				Grand Total
		1	3	4	5	6	7	8	9	Agree No.	Agree %	Disagree No.	Disagree %	
Well		2	14	16	35	4	21	51	..	109	76	34	24	143
River		20	1	23	3	..	2	..	8	41	72	16	28	57
Surface		13	..	..	12	5	1	..	..	19	61	12	39	31
Stream		..	5	..	..	..	..	3	..	4	50	4	50	8
Spring		..	..	2	..	6	4	5	..	12	71	5	29	17
Lake		7	6	5	1	..	1	..	10	23	77	7	23	30
Creek		6	..	7	..	6	1	..	..	14	70	6	30	20
Reservoir		..	2	20	..	8	1	..	..	24	79	7	21	31
Tap		..	10	15	2	..	..	1	..	28	100	0	0	28
Ground		..	..	..	..	..	..	..	..	0	..	0	..	0
Cistern		..	..	..	..	..	3	3	..	4	67	2	33	6
Pond		..	..	..	..	..	..	..	..	0	..	0	..	0
Raw		..	1	..	..	..	..	2	..	3	100	0	0	3
TOTAL		48	39	88	53	29	34	65	18					874
Agree	No.	41	30	73	30	15	23	55	14	281				
	%	85	77	83	57	52	68	85	78		75			
Disagree	No.	7	9	15	23	14	11	10	4			93		
	%	15	23	17	43	48	32	15	22				25	

of an MF count, although not precisely known, has been estimated from preliminary data to be considerably smaller than that of the MPN but is somewhat greater than would be predicted by the assumption of a Poisson distribution. Second, the procedure adopted provides a simple, readily applied and understandable criterion for comparing the results obtained by the two technics with a minimum of computation.

Results in Tables 1, 2, and 3 are recorded as to source. The sources are tabulated as designated by the participating laboratories with no attempt to interpret or regroup them having been made. Samples from 17 categories of ground and surface sources are included. The largest numbers of samples are from wells and rivers. There are considerable variations in the number of samples per source and as to agreement or disagreement of results from one period to another during the study. The total number of samples showing agreement and disagreement are shown also for each participating laboratory.

In Table 4 the comparative results are summarized for each period of study. In this table the agreement group of results is broken into "positive agree," "± agree," and "negative agree" categories. The definitions of the group are given in the legend of the table.

The MF results for the period January 1–March 31, 1953, using modified Endo medium, show 79.2 per cent agreement with the MPN, an increase of 11 per cent agreement over the preceding period. It seems likely that the increased agreement of results are favorably influenced by increased experience in the technic, together with improvements in media and procedure. The reasons for the 4 per cent drop in agreement (from 79.2 to 75.1) in the period April 1–June 30, 1953, as compared to the preceding period are not apparent. The BGF medium used in the MF procedure during this period, though definitely inhibitory to noncoliform Gram-negative bacilli, may also have adversely affected the growth of coliform organ-

Table 4—Distribution of Comparative Results per Period of Study

Period	Medium		Positive * Agree	± † Agree	Negative ‡	Disagree **	Total
July 1–Dec. 31 1952	Endo	No.	332	40	92	218	682
		%	48.7	5.9	13.5	31.9	
Jan. 1–Mar. 31 1953	Modified Endo	No.	214	50	251	135	650
		%	32.9	7.7	38.6	20.8	
Apr. 1–June 30 1953	B.G.F.	No.	143	24	114	93	374
		%	38.2	6.4	30.5	24.9	
	Total	No.	689	114	457	446	1,706
		%	40.4	6.7	26.8	26.1	
				73.9			

* MF and MPN are definitive values and the MF results fall within the 95 per cent confidence limits of the simultaneously determined MPN

† One result is indeterminately low, i.e., less than 1.8/100 ml. for MPN and less than 2/100 ml. for most MF results, and the other result is within the 95 per cent confidence limits, i.e., 5.4/100 ml. for the MPN and 6/100 ml. for the MF

‡ No coliform organisms demonstrated by either procedure

** MF and MPN results are definitive values and the MF results fall outside the 95 per cent confidence limits of the simultaneously determined MPN

isms (Tables 5 and 6). Of the 1,706 samples examined during the entire test period, approximately 74 per cent show agreement of MF and MPN results within the definitions given. If the two technics truly measured the same organisms and the differences in results were due only to sampling errors, an agreement of between 90 and 95 per cent would be expected.

The "± agree" group of results (Table 4) are summarized in more detail in Table 5. In the examinations of these samples, no coliform organisms are demonstrated by one test, while simultaneous examination by the other procedure shows coliform organisms present. A water sample showing no gas in 24 or 48 hours when examined by the five-tube, three-dilution fermentation tube test with 10 ml., 1 ml., and 0.1 ml. of sample in the three dilutions has an MPN of zero, but is commonly recorded as less than 1.8 coliforms per 100 ml. The upper limit of the 95 per cent confidence zone of this negative result has been calculated as 5.4. That is, if the true coliform density is greater than 5.4 per 100 ml., the probability of obtaining the negative result is less than 0.05. The upper limit of the 95 per cent confidence zone of a negative MF result using 50 ml. samples is six per 100 ml.

It is shown that, in these samples, the confirmed MPN procedure gave positive results for coliform organisms more frequently than the MF technic. Laboratory data available but not presented in this report indicate that the results of the MF test more nearly approach those of the completed MPN test for samples of low coliform content because many of the fermentation tubes showing gas in the confirmed test fail to show the presence of coliform organisms by the completed test. Further investigations are needed to determine whether the discrepancies in results are real or apparent, i.e., are all organisms that produce gas in brilliant green bile broth true coliform organisms?

Table 6 summarizes the results of examination for which those of the MF procedure do not fall within the 95 per cent confidence limits of the simultaneously determined MPN. It is again

Table 5—Summarization of Comparative Results for Samples Having Coliform Contents in the Range Associated with Potable Water (± Agree)

Laboratory	July 1–December 31, 1952			Jan. 1–March 31, 1953			April 1–June 30, 1953			Grand Total
	MF <2 * MPN <5.4	MF <6 † MPN <1.8	Total	MF <2 MPN <5.4	MF <6 MPN <1.8	Total	MF <2 MPN <5.4	MF <6 MPN <1.8	Total	
1	5	1	6	0	0	0	3	1	4	10
2	4	0	4	..	..	..	..	..	..	4
3	5	0	5	2	0	2	4	0	4	11
4	1	1	2	6	1	7	4	0	4	13
5	2	7	9	7	1	8	1	0	1	18
6	0	1	1	3	4	7	2	0	2	10
7	1	0	1	3	2	5	1	1	2	8
8	10	2	12	14	7	21	4	0	4	37
9	..	..	..	0	0	0	3	0	3	3
Total	28	12	40	35	15	50	22	2	24	114

* No coliforms demonstrated by MF procedure, MPN a determinate result of less than 5.4 per 100 ml.
† No coliforms demonstrated by MPN procedure, MF a determinate result of six or less per 100 ml.

Table 6—Summary of Results for Which Those of the MF Procedure Do Not Fall Within the 95 Per cent Confidence Limits of the Simultaneously Determined MPN

Laboratory	July 1–December 31, 1952					January 1–March 31, 1953					April 1–June 30, 1953					Grand Total
	MF <2 MPN >5.4	MF >6 MPN <1.8	MF or MPN <100	MF and MPN >100	Total	MF <2 MPN >5.4	MF >6 MPN <1.8	MF or MPN <100	MF and MPN >100	Total	MF <2 MPN >5.4	MF >6 MPN <1.8	MF or MPN <100	MF and MPN >100	Total	
1	3	1	23	4	31	0	0	5	0	5	1	0	5	1	7	43
2	3	3	18	27	51	..	..	..	..	..	..	..	..	..	..	51
3	3	1	9	10	23	2	0	5	0	7	5	0	2	2	9	39
4	0	0	13	13	26	0	0	3	4	7	2	0	8	5	15	48
5	0	3	7	5	15	4	0	18	2	24	7	0	13	3	23	62
6	1	1	14	10	26	2	1	8	2	13	4	0	7	3	14	53
7	1	1	7	10	19	4	0	16	14	34	4	0	3	4	11	64
8	4	1	16	6	27	8	3	14	7	32	5	0	5	0	10	69
9	..	..	..	..	..	0	1	11	1	13	0	0	2	2	4	17
Total	15	11	107	85	218	20	5	80	30	135	28	0	45	20	93	446

shown that, in these samples, the MF technic gave positive results for the presence of coliform organisms less often than did the MPN procedure.

Table 7 shows an apparent increase in the percentage of agreeing results during the first 10 months of the study, although there is little variation during the latter months from December through April. Because of the apparent increases of disagreements in May and June, the effect of seasonal variation must be considered. Sufficient data are not presently available to answer this problem. A number of other variable factors may have contributed to the discrepancies.

There is no readily apparent relationship between the agreement of results by the two tests, and any recorded physical or chemical characteristic of the water samples examined except that turbidity tends to limit the volume of sample that can be examined by the MF procedure. The deposition of sufficient suspended matter on the membrane may result in confluent growths of the bacteria; under these conditions, sheen development is inhibited or eliminated. Light flocculent materials more readily retain a film of fluid on the membrane and produce unsatisfactory results more frequently than dense particulate matter. It is therefore necessary to examine relatively small quantities of highly turbid samples. If the samples of high turbidity have low coliform content satisfactory examination by the MF technic may prove difficult or impossible.

Summary

The results of 1,706 water samples examined simultaneously by the MF and MPN procedures are reported. The re-

Table 7—Comparative Results of MF and MPN Procedures by Month of Study

Month	No. of Participating Laboratories	Positive * Agree	± † Agree	Negative ‡ Agree	Disagree ** No.	Disagree ** Per cent	Total
July 1952	3	28	1	9	21	36	59
Aug. "	5	54	6	17	37	32	114
Sept. "	6	70	7	20	48	33	145
Oct. "	7	58	9	11	40	34	118
Nov. "	8	54	6	15	40	35	115
Dec. "	7	68	11	20	32	24	131
Jan. 1953	4	42	7	19	20	23	88
Feb. "	7	85	17	94	54	22	250
Mar. "	7	87	26	138	61	20	312
April "	3	41	8	64	29	20	142
May "	7	60	12	37	37	25	146
June "	4	42	4	13	27	31	86
Total		689	114	457	446	26	1,706

* MF and MPN are definitive values and the MF results fall within the 95 per cent confidence limits of the simultaneously determined MPN

† One result is indeterminately low, i.e., less than 1.8/100 ml. for MPN and less than 2/100 ml. for most MF results, and the other result is within the 95 per cent confidence limits, i.e., 5.4/100 ml. for the MPN and 6/100 ml. for the MF

‡ No coliform organisms demonstrated by either procedure

** MF and MPN results are definitive values and the MF results fall outside the 95 per cent confidence limits of the simultaneously determined MPN

sults by the two methods are compared on the basis of the 95 per cent confidence limits of the confirmed MPN. On this basis, results of 1,260 (73.8 per cent) of the 1,706 are in agreement. Of 650 samples (114 "± agree," 457 "negative agree," 79 "disagree") having a coliform content in the range associated with potable waters, 571 (88 per cent) show results in agreement by the two tests. Although turbidity of a sample must be considered in the choice of volume to be examined, there is no other readily apparent relationship between agreement of results by the two coliform tests and any recorded physical or chemical characteristic of the sample. These results indicate that the two test procedures do not measure precisely the same group of organisms and that the sanitary significance of the differences in the results of the procedures is yet to be determined. Additional investigations are needed to acquire data relative to the possible effect of seasonal variations and certain aspects pertaining to medium and procedure. A full description of a procedure for determining the coliform content of water by the MF technic will appear in the 10th Edition of Standard Methods for the Examination of Water and Sewage, now in preparation, as a Tentative Method.

ACKNOWLEDGMENT—The author gratefully acknowledges the assistance of H. F. Clark, E. E. Geldreich, and H. L. Jeter in the preparation of the tentative procedure for the examination of water by the MF technic, and of Drs. R. L. Woodward, E. K. Harris, and H. A. Thomas, Jr., for advice on the statistical compilation and presentation.

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American Journal of

PUBLIC HEALTH

Official Monthly Publication of the American Public Health Association, Inc.

Volume 44 | March, 1954 | Number 3

Setting Our Sights for the Future

✢ The four papers published in this issue of the Journal were presented at the APHA Annual Meeting in New York under the title, "Setting Our Sights for the 81st Annual Meeting." As the reader will discover, they have a wide significance and, in their implications, bring out important trends which should govern the evolution of the public health program of the future.

Two such major trends are indicated in these prophetic contributions. The first of these is toward a closer correlation between the community health program and the other social programs of a given community. The pioneer investigations of the Community Research Associates in St. Paul have revealed the intimate relationship between problem families and the fields of health, delinquency, and economic handicap. In that city about 6 per cent of the population were absorbing well over half of all health and welfare funds, both public and voluntary. Further, they disclosed that "more than half of these people had developed multiproblem patterns and that, to effect rehabilitation and prevent recurring cycles of misery, they would require family-centered treatment rather than the scattered attempts by representatives of many agencies treating various facets of the problem." Community Research Associates are now repeating and expanding their investigations in three areas, Hagerstown, Md., Winona, Minn., and San Mateo, Calif. It is evident that poverty, ill-health, and delinquency are intimately correlated. It is important that the health officer should recognize this fact and should realize that his activities must be integrally tied in with those community agencies concerned with relief and law enforcement. The development of a strong health and welfare council for coordinated community planning will be an essential step in this direction.

The second trend brought out in our New York discussions was toward the need for more understanding and vigorous support of the total program of social reconstruction by the community as a whole. We need a strong community welfare council for total planning, but we also need a far more vital comprehension of local social needs which will elicit the active support of the Chamber of Commerce, the Manufacturer's Association, the AFL and CIO, the women's clubs, church groups, and the like. The word "support" is, however, an unfortunate one. It suggests that a plan has been made by the experts and presented for approval; but much more than this is needed. The demand for creating a more wholesome society should come from the people themselves and the sound technics of health

education involve joint discussion and joint planning—not only between various groups of experts but between the experts and the citizens. The struggle against disease, poverty, and social maladjustment is a "People's War." Only when the average citizen understands that the burdens of maladjustment are far more costly than their prevention will the community as a whole be able to adopt a sound policy of prevention. Our motto should be "Millions for defense but not one cent for tribute," in respect to the factors which create physical and emotional and social maladjustment in our American communities.

Use of Human Cancer Cells to Diagnose Poliomyelitis

✣ Paralytic cases of poliomyelitis are easily diagnosed on clinical grounds alone, but in mild, atypical or abortive cases clinical symptoms only are usually insufficient to support a positive diagnosis. In such instances physicians have often expressed the wish that a practical laboratory procedure—such as virus isolation or antibody determination—were available to aid them in establishing a diagnosis. Up to the present, however, such procedures, although feasible, have been too complex and costly to permit their use in anything except research investigations.

A discovery recently made at the University of Minnesota by Syverton and Scherer [1] should do much to simplify such diagnostic procedures in the future and make them available for general practice.

These investigators have reported that a strain of human cancer cells isolated in February, 1951, by Gey and his co-workers,[2] from a carcinoma of the cervix is highly susceptible to poliomyelitis virus. Cytopathogenic changes in those cells become evident in from 12 to 72 hours. The cells themselves grow as sheets on glass surfaces in the absence of plasma. They are readily released by trypsin to provide a homogeneous suspension which is then suitable for the inoculation of fresh tissue culture tubes.

The patient from whom this strain was obtained died six months later, but the HeLa strain of cells, which bears her name, lives on in poliomyelitis laboratories all over the world. It is a paradox of medical science that such a lethal agent as human cancer cells can be used for the diagnosis of poliomyelitis.

There are several advantages to employing the HeLa strain of cancer cells rather than cells of monkey origin for isolating and typing new strains of virus, as well as for measuring antibody levels in the peripheral circulation. These advantages include the uniform susceptibility of cells of the HeLa strain and the unusual rapidity of their growth.

A report just published by Syverton, Scherer, and Elwood [3] sheds further light on the adaptability of the HeLa strain of human epithelial cells to the isolation and typing of new strains of poliomyelitis virus. During the past year and a half, 300 strains of virus from patients admitted to hospitals in Minnesota and Iowa have been isolated and typed by this new technic. Among them, 74.5 per cent belonged to Type 1, 5 per cent to Type 2, and 20.5 per cent to Type 3. It is noteworthy also that the cost of this project amounted to only a small fraction of the cost of the original typing program which was carried out and completed during the era when monkeys alone were being used for such investigations.

At the present time the National Foundation for Infantile Paralysis is continuing its original support of this interesting development by having several laboratories attempt the large-scale preparation of standardized cultures of HeLa cells which can be shipped widely to hospitals, health departments, and laboratories to be used as an aid in the rapid diagnosis of suspect cases of poliomyelitis.

1. Syverton, J. T., and Scherer, W. F. Utilization of a Stable Strain of Human Epithelial Cells (HeLa, Gey) for Diagnosis of Poliomyelitis. Federation Proc. 12:462, 1953.
2. Gey, G. O., Coffman, W. D., and Kubicek, M. T. Tissue Culture Studies of the Proliferative Capacity of Cervical Carcinoma and Normal Epithelium. Cancer Research 12:264, 1952.
3. Syverton, J. T., Scherer, W. F., and Elwood, P. M. Studies on the Propagation in vitro of Poliomyelitis Viruses. V. The Application of Strain HeLa Human Epithelial Cells for Isolation and Typing. J. Lab. & Clin. Med. (Feb.), 1954.

The President's Health Message

✢ On January 18, 1954, President Eisenhower sent a Health Message to Congress, outlining the health policy of the Administration. The specific recommendations for action are based on the proposition that "two of the key problems in the field of health today are the distribution of medical facilities and the costs of medical care." They call for (1) continuation of the health programs of the Department of Health, Education, and Welfare, with strengthening of the research activities of the Public Health Service; (2) establishment of "a limited Federal Reinsurance Service" to aid in the expansion of voluntary medical care insurance; (3) development of a simplified formula for all basic grant-in-aid programs of federal agencies, with special attention to "progressive expansion of our rehabilitation resources"; and (4) amendment of the Hospital Survey and Construction Act to permit assistance for construction of nonprofit hospitals for the care of the chronically ill, nonprofit medically supervised nursing and convalescent homes, nonprofit rehabilitation facilities for the disabled, and nonprofit diagnostic or treatment centers for ambulatory patients.

The message is noteworthy in several respects. It acknowledges the existence of serious problems in the broad field of medical care. It endorses the principle of federal grants-in-aid for medical research, construction of needed facilities for medical care, and operation of various types of health service programs under public auspices. It rejects "socialization of medicine" and advocates that the federal government, instead of going "into the insurance business" on its own initiative, should work with the voluntary organizations offering medical care insurance "to study and better insurance protection to meet the public need." The message omits any reference to professional education for direct service and administration, to full-time local health units, and to transformation of the present sickness insurance organizations into health care plans.

Federal reinsurance of certain expenses incurred by voluntary organizations offering medical care insurance has been suggested before in Congressional bills. As this method is now endorsed in a Presidential message and elaborated upon in the recently introduced Wolverton Bill it should be studied carefully by the public health profession. The aim of the proposed Federal Reinsurance Service is "to encourage private and nonprofit health insurance organizations to offer broader health protection to more families." To this end "the special additional risks" involved in extension of voluntary medical care insurance would be reinsured by

the federal government through establishment of a capital fund of $25 million to be retired from fees for reinsurance.

One week after the President's message the Health Information Foundation, New York City, released preliminary reports on a nation-wide study of voluntary medical care insurance carried out for the foundation by the National Opinion Research Center at the University of Chicago. These reports, based on careful analysis of a representative sample of the civilian noninstitutional population, contain a wealth of factual information previously not available. In July, 1953, 57 per cent of the American people had some insurance for hospitalization, 48 per cent had some insurance covering professional services, mainly surgical and non-surgical services in the hospital, and about 3 per cent had insurance of more comprehensive scope. Medical care insurance was most common in the income group $5,000 and over (80 per cent insured) and much less frequent in the income group under $3,000 (41 per cent insured). It was found in 70 per cent of the families in urban areas but only in 45 per cent of the families in rural farm areas.

In the last twenty years, voluntary medical care insurance has made extraordinary progress. But the test of the value of any medical care program is the degree of protection afforded and the quality of service rendered, rather than the number of persons covered. As the detailed data published by the Health Information Foundation * show, voluntary medical care insurance in 1953, covered 15 per cent of the $10.2 billion private expenditures for medical care in the wide sense of the term—50 per cent of the expenses for general hospital care, 13 per cent of those for physician's services and practically nothing of all other expenses. The average cost incurred, after the amount covered by insurance and the premiums paid, was $178 per family, the cost of physician's services accounting for almost two-fifths and that of dental care for close to one-fifth of the total. Significantly, the percentage of income spent on medical care was less than 5 per cent for 53 per cent of all families, between 5 and 9 per cent for 22 per cent of them, and more than 10 per cent for 19 per cent of all families. For one out of two insured families voluntary medical care insurance covered 89 per cent of the gross hospital costs, 75 per cent or more of the gross surgical costs, and 60 per cent or more of the gross obstetrical costs. Debts for medical care were very substantial. About 15 per cent of all families owed sums aggregating more than $1 billion and the average amount owed was $121 per family with debt.

These are striking findings. They require due consideration in judging the potential value of legislative proposals for the extension and improvement of voluntary medical care insurance.

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* Health Information Foundation Survey of Medical Costs and Voluntary Health Insurance. Health Information Foundation, 420 Lexington Avenue, New York, N. Y.

Clearing House on Public Health Salary Information and Personnel Needs

Salaries Still Behind the Times

Beginning in 1947 the American Public Health Association, the Association of State and Territorial Health Officers, and the Public Health Service have cooperated in making an annual study of salaries of state public health workers. Data for the seventh study were obtained from August, 1953, pay rolls.

Salaries were reported by all 48 states and by Alaska, Hawaii, Puerto Rico, and the Virgin Islands. The 1953 study covered 3,929 state and 168 territorial employees. Median salaries were calculated for health officers, directors of five nonmedical programs, and 11 separate occupational groups.

This latest study has two variations from the earlier studies. First, the single calculated median was used to identify the typical salary for each group of workers instead of the median salary interval and the arithmetic mean used earlier. Earlier figures were also recomputed on this basis. Second, information about November, 1940, salaries for nine of the occupations groups is also reported for purposes of comparison.

Salary Changes During the Past Year

The largest gross percentage increase in median salaries between August, 1952, and August, 1953, occurred for veterinarians and business management officers, 11 per cent. Dentists, other than dental program directors, registered only a 2 per cent increase, the lowest recorded for any group.

Geographically, median salaries on the West Coast are the highest. Next highest medians were recorded for those North Central and Middle Western states included in USPHS Regions 5 and 6.

In last year's study, 23 of 44 state health officers were reported receiving annual salaries of $10,000 or more. In this year's study all but 10 of 42 were reported at or above the $10,000 level. In the previous year's study about one-fourth of the medical personnel other than state health officers received annual salaries of $10,000 or more. In the current study more than one-third, scattered among 24 states, received such salaries. Directors of sanitary engineering and directors of laboratory services in eight states received $10,000 or more, but five states paid less than $7,000 for engineering directors and 14 states for laboratory directors. In 1952 only five engineering directors and three laboratory directors were reported receiving $10,000 or more. No state paid its public health nursing director as much as $10,000 annually, which may be a function of the double standard of salaries. However, the number receiving less than $6,000 decreased by more than one-third over the previous year. The number of directors of dental health services being paid $10,000 or more increased from four to six during the year, the number receiving less than $6,000 decreased from six to three.

Long-Time Trends

In terms of trends, the peak gains in salaries of state public health workers during the six-year period seems to have been reached in 1951. Since then there has been a decline in the rate of salary increases. Unless a sudden change in the economic situation stimulates an un-

usual adjustment, a further leveling off of the salaries of state public health workers may result in 1953–1954.

Table 1 shows the per cent increase in salaries for 17 different types of workers for three different periods for nearly all of the categories—the past year, the seven-year period during which the state salary studies have been made, and the period since 1940 before both salaries and cost of living took their substantial upward rises. For the longest period two sets of percentage increase figures are shown—one representing the simple dollar rise, the other representing the rise in real income after adjustment to the increased cost of living,* but not taking into account the increase in federal income taxes or, in fact, state income taxes. The number of workers in each category reported in 1953 is also shown as a frame of ref-

Table 1—Percentage Increase in Salaries, Certain Public Health Workers, Three Separate Periods

Occupational Group	Number Reported 1953	Percentage Increase in Salaries			
		1952–1953	1947–1953	1940–1953	
				Unadjusted	Adjusted *
Total	3,929				
Medical					
Health Officers	42	7.6	53.3	123.6	16.5
Other	381	5.9	63.4	135.8	22.9
Dental					
Directors	37	4.7	64.4	122.1	15.7
Other	44	2.0	..	..	..
Sanitation Personnel					
Directors	47	2.3	40.0	95.3	1.8
Other Engineers	507	9.5	38.4	121.6	15.4
Other Personnel	590	2.9	67.8	..	..
Public Health Nursing					
Directors	47	5.3	42.9	98.5	3.4
Consultant and Supervisory	362	4.9	49.2	119.2	14.2
Laboratory Workers					
Directors	45	4.9	36.2	100.0	4.2
Other Professional	1,217	9.3	42.3	..	..
Statisticians					
Directors	39	7.1	33.3	71.4	10.7
Other	141	4.0	..	..	..
Health Educators	197	5.5	..	..	..
Nutritionists	129	5.1	48.5	..	..
Business Management Officers	73	10.8	..	..	..
Veterinarians	31	11.1	..	..	..

* See p. 393 for a detailed statement of the method by which this adustment was made and for a discussion of the effect of the rise in federal income taxes on real income or take home pay of workers.

erence, although obviously this number does not apply to other years.

Even though as many as two-thirds of the state public health workers received salary increases, the general decline in rate of increase indicates that a period somewhat similar to 1940–1947 may be approaching with salary increases tending to lag behind price increases. From November, 1940, to November, 1947, the median salaries for nine groups of state public health workers—state health officers, other medical personnel, dental directors, laboratory directors, sanitary engineering directors, sanitary engineers, public health nursing directors, supervisory and consultant public health nurses, and vital statistics directors—increased an average of 43 per cent.

Cost of living measured by the Bureau of Labor Statistics consumer price indexes increased by 65 per cent during the same seven years, however, so that the median real incomes for these nine groups deceased an average of 13 per cent. Sharp tax increases caused a further decrease in net spendable income. During the last six years salaries for state public health workers have increased at rates in excess of increases in the Bureau of Labor Statistics consumer price index, but have not fully compensated for tax increases since 1939.

Between November, 1940, and August, 1953, the price index increased from 60 to 115, an increase of 92 per cent. Gross increases in the salaries of state public health workers ranged from 71 per cent for vital statistics directors to 136 per cent for medical personnel exclusive of state health officers. When these increases are adjusted on the basis of the cost of living, changes in real income before taxes then range from minus 11 to plus 23 per cent. Although the median adjusted salary for vital statistics directors is the only one below the 1940 income level on this basis, median adjusted salaries for three other classes are less than 5 per cent above the November, 1940, level—laboratory director, public health nursing director, and sanitary engineering director. Except for medical personnel exclusive of state health officers, the median adjusted salaries of the other four classes of state personnel—health officers, dental directors, sanitary engineers, and supervisory and consultant public health nurses—are approximately 15 per cent above the level of November, 1940, salaries.

Such narrow margins of increase indicate that public health workers have suffered both an absolute and a relative decline in net spendable income since 1940 when considered in relation to other economic factors that are not taken into account by the Consumer Price Index. Tax increases are one major item omitted. Further, public health workers should share in the increments of wealth accruing from increased economic productivity. These are estimated to amount to 2.5 per cent each year and are distributed to consumers as either price cuts or salary increases. Public health workers, no less than other productive groups, have contributed to the continuing economic well-being of the nation. (A detailed discussion of price, tax, and productivity factors follows.)

The method of computation of current salary scales necessary to maintain the position of a public health worker at the pre-World War II level was presented in the July, 1949, issue of Public Health Nursing and in the Clearing House, A.J.P.H., March, 1950, pp. 328–334. To recapitulate:

1. A salaried public health worker lives on his net spendable income (take-home pay) after income tax deductions.

2. In 1939 a person with no dependents paid $14 income tax on a salary of $1,500 per year. A married man with two children paid no income tax on a $3,000 salary. By November, 1940, salaries had not been raised and income taxes were still low.

3. Today, due to price rises from November 1940, to August, 1953, the above 1939–1940 salaries must be boosted by 92 per cent, to $2,880 and $5,760, respectively, in order to equal 1939 purchasing power.

4. Productivity increases of 2 to 3 per cent per year for 13 years would increase these figures by from 26–39 per cent, not compounded. Allowing for a conservative 30 per cent of the 1940 salaries for this item increases the figures in (3) to $3,330 and $6,660, respectively.

5. Since $3,330 and $6,660 are cash after federal income withholding taxes, gross salaries large enough to leave this amount after taxes at 1953 rates must be provided.

a. For a single person a salary of about $4,000 per year means a federal income tax of $670, leaving him $3,330 net take home pay.

b. For a married man with two minor children on a salary of about $7,600 per year, the federal withholding income tax is $940, leaving $6,660 net spendable income.

6. Therefore, incomes of $1,500 and $3,000 in 1939 need to be $4,000 and $7,600 in August, 1953, to have maintained the health worker's position. These are increases of 167 per cent and 153 per cent, respectively. It will be noted that these are larger than any increases noted in the table.

7. By the same method, but working backward, we can reduce the 1953 median salary rate for state health officers and see what such a job would have paid in 1939–1940 if the current rate reflected fully price rises, taxes, and productivity:

a. 1953 median salary	$11,500
b. Less withholding taxes for a married man with two minor children (Actual tax with only standard deductions in 1953 was $1,901.)	1,800
c. Difference (a – b) net spendable income	9,700
d. Productivity: $9,700 ÷ 1.30 (as in item (4) above)	7,460
e. Cost of living: $7,460 ÷ 1.92 (as in item (3) above) (Salary in 1939–1940 equivalent to salary of $11,500 per year in August, 1953.)	3,880

8. Even if the productivity factor is ignored, the only occupational group that has had increases sufficient to permit payment of price and tax rises from increased income has been medical personnel other than health officers.

9. When pay rises lag behind price and tax rises and are not retroactive, the worker's loss in spendable income accumulates each year that he has a deficit. For example, if a nurse received tardy and partial salary adjustments from 1939 to 1952 so that each year her purchasing power fell $200 short of its 1939 level, she would have lost $200 per year for 13 years or $2,600. If in 1953 her salary should rise to a point where she was $500 ahead of 1939 in purchasing power, her loss in purchasing power for the 14-year period would be $2,100.

10. This loss of purchasing power would have occurred while purchasing power of other groups was rising due to increases in salary or income large enough to more than compensate for price and tax rises since 1939.

11. Public health workers since 1939–1940 have not shared in the rise in productivity of the American economy.

12. If prices should stabilize or decline moderately, health workers would still need salary increases to regain their 1939–1940 level of living.

13. The 10 per cent across-the-board cut in income taxes in 1954 will help, but will not bring net spendable income back to 1939–1940 levels.

14. Any specific individual should expect to have had an income rise larger than that arrived at in the foregoing computations if, since 1940, he has had either promotion or salary increments.

NFIP Public Health Fellowships

The National Foundation for Infantile Paralysis announces a number of postdoctoral fellowships in public health and preventive medicine. Their purpose is to prepare physicians to fill the many vacancies existing in this field with priority to those who wish to enter teaching. Applicants must have been graduated from an approved school of medicine, have completed at least one year's internship in an approved hospital, and be United States citizens.

The fellowships are for one or more years at an approved school of public health with a period of field experience when arranged by the school. Stipends are based on the individual need of each applicant and may cover tuition, main-

tenance, and an allowance for books, if required.

The National Foundation's fellowships in public health and preventive medicine were instituted in 1946 through a grant from the foundation to the Public Health Service. For the two years during which the program was administered by the Public Health Service, $152,151 was expended for the training of 39 physicians and 55 sanitary engineers. Since 1948 the program has been administered directly by the Division of Professional Education of the foundation for the training of physicians. During this period $320,600 has been appropriated and 58 postdoctoral fellowships have been awarded.

Selection of candidates is made on a competitive basis by a Clinical Fellowship Committee of NFIP composed of leaders in the field of medicine and professional education. Complete information concerning qualifications and applications may be obtained from the Division of Professional Education, the National Foundation for Infantile Paralysis, 120 Broadway, New York 5.

In 1953 the program was expanded to include medical students who had completed a minimum of two years in medical school and who had eight weeks of consecutive free time to devote to extracurricular study. The purpose of these fellowships is to enable the student to receive an orientation in public health and preventive medicine with the view of helping him to determine his own aptitudes and inclinations early in his career. The deans of each of the medical and basic science schools in the United States were invited to nominate two candidates from their respective schools and 58 students participated during 1953. The program is being continued for the current year.

In this program fellowships are offered for public health and preventive medicine, for physical medicine and rehabilitation, and for research in the basic sciences related to medicine. The dean of each medical school is invited to nominate two candidates for each of the first two fellowships and one for the third. Stipend for the eight-week period is $400. For further information and application forms, students should consult with the deans of their respective schools.

Dorr Fellowship in Sanitation

The Dorrco Educational Trust, founded for educational and scientific purposes for the benefit of the public, has established a graduate fellowship in sanitation. For 1954–1955 this is being offered in the Department of Sanitation, Rutgers University. Citizens of the United States or Canada holding bachelor or master of science degrees in bacteriology, biochemistry, biology, or sanitary, civil, or chemical engineering are eligible. Stipend is $1,800 a year plus tuition.

The fellowship was established in commemoration of the 50th anniversary of the invention of the Dorr Classifier by John Van Nostrand Dorr, president of the Dorr Company, manufacturers of sanitation equipment, and a graduate of Rutgers University.

Application for the fellowship must be made by April 1. Application forms and further details from Professor Harold E. Orford, Department of Sanitation, Rutgers University, New Brunswick, N. J.

Books and Reports

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

The Limits of the Earth — By Fairfield Osborn. Boston, Mass.: Little, Brown (34 Beacon St.), 1953. 238 pp. Price, $3.50.

The author's dedication of this volume "To all who care about Tomorrow" is a felicitous warning that he challenges thoughtful people to consider the adequacy of the world's resources in relation to present and future populations. His plea, in more measured terms than in the earlier volume, "Our Plundered Planet," is that "the boon that public health measures afford humanity" must be matched by equally thoughtful action on "the disastrous consequences of overpopulation."

To point up his position in "The Great Debate," the author reviews in broad terms the resources (and dominantly, the food) situation in Great Britain and Europe, Australia, Canada, and Argentina, the United States, Africa, South Africa, the Amazon, beyond Europe and East of Suez. He paints the picture colorfully, dramatically, and with an inescapable drive to his final conclusion that we can now see "the limits of the earth." One misses, however, on so broad a canvas the exact, quantitative data, upon which the ultimate decisions as to solution of the population problem must rest. These decisions are unlikely to be determined by vast generalizations equally applicable everywhere in the world.

The potentials of the United States cannot be easily equated to those of India, the Amazon, or the Africas. The history of agricultural development in the United States over the last half century is a heartening one. The doubling of its population was more than matched by its food production at a lower unit cost. Dudley Stamp only recently characterized the lands of North America "among the most underdeveloped lands in the world."

On one significant observation by Osborn, most careful workers would undoubtedly agree—that to make resources available time and international comity are essential ingredients. Money alone will not be the easy or great transformer of poverty to riches. The road will be long, hard, and cooperative. The public health worker has a major stake in the effort, as well as in the debate, whether he aligns himself with the Osborns, the Vogts, the Myrdals, or the Winslows! Malthus as a prophet waits to be reinterpreted in the light of the modern arts and sciences. Osborn serves society most usefully by reiterating that the peoples of the world grow at a rate exceeding 70,000 per day. We still lack, however, a realistic estimate of the "carrying capacity" of the earth either now or in the future (C. V. Kiser).

ABEL WOLMAN

The Book of Health. A Medical Encyclopedia for Everyone — By R. Lee Clark and Russell W. Cumley, Editors-in-Chief. New York: Elsevier Press (300 Park Avenue), 1953. 768 pp. Price, $10.00.

As the subtitle of this volume indicates, it is a medical encyclopedia for the public. It is not a "home doctor book," but is intended rather to give the reader an understanding of what can be done by medical science today in dealing with problems of health and disease. In line with this purpose the 28 chapters deal with the development

of the body, its structure and function, the noxious influences to which it may be exposed, the various disease conditions to which the flesh is heir, and finally separate sections on sickness at home, physical injuries and first aid, tropical diseases, sanitation, medicine and the law, medical history and the medical profession.

Responsible for this work are R. Lee Clark, a surgeon, and Russell W. Cumley, a medical journalist, both of the University of Texas, assisted by a galaxy of advisory and associate editors listed in over eight printed pages. In addition, 30 professional writers and a staff of artists and photographers prepared the actual text and illustrations which went into the published volume. Truly, a collective enterprise! Furthermore, the volume has been lavishly prepared with numerous illustrations, of which many are in color.

What has this array of talent produced? This volume is chock-full of facts, and chiefly facts about disease. Indeed, despite explicit statement by the editors that the preventive and curative aspects of health care must today receive equal recognition, most of this volume is concerned with disease. The reader of this book cannot obtain from it a coherent picture of what preventive medicine and public health are today. According to the publisher's blurb, this volume "tells you what your physician wants you to know about your body," and the contents reflect a medical practitioner's viewpoint. This is not intended to detract from a solid production which has a number of uses, but it is not a book of health. Furthermore, the language in which it is written is not for general consumption. It is at least on a college level, if not higher, and is therefore definitely not for everyone.

Within these limitations, however, there is much in this book that is useful. It is a ready reference for factual information about specific diseases. It has numerous excellent illustrations as, for instance, those that show the birth of a child, or the photographs in the chapter on sickness at home. From this point of view it should prove useful to various workers in the health field who are not medically trained—science writers, medical administrators, social workers, and similar workers.

Readers should be cautioned, however, that all historical information in it must be accepted with suspicion. There are numerous errors of fact concerning the history of medicine, and this is indeed the weakest phase of this book. Within the qualifications indicated, this is a useful reference work.

GEORGE ROSEN

Basic Skills in Sports for Men and Women—By David A. Armbruster. St. Louis, Mo.: Mosby (3207 Washington Boulevard), 1953. 325 pp. Price, $3.50.

As suggested by the author in his introduction, this paper-covered, letter-size volume might well be termed a digest of various sports activities for the student in the basic physical education program and a guide for teachers of physical education. Twenty-eight sports activities, six of which are team and 22 individual in nature, make up the contents.

By and large, the various sports are presented in concise form, with brief coverage of history, general or abridged rules, equipment, basic fundamental skill technics, instructional and learning procedures, particular points to be remembered, references, and in numerous cases, films, safety precautions, terminology, and suggestions concerning evaluation of achievement.

In such a digest it is impossible to present the team sports as thoroughly as the professional physical educator would desire. Teacher education personnel will find the volume a constructive guide to a variety of sports activi-

ties, but in need of supplementing for instructing professional students. As is to be expected in such a publication, certain sports are presented more thoroughly than others. Illustrations prove very beneficial in a number of the sports, though they are totally absent in a number of activities where they might be highly valuable.

Due to the fact that the author has long been a recognized authority on swimming and diving, the readers will find these two activities very well covered, including highly descriptive illustrations. A unique feature is a chapter devoted to sports and recreational activities for use around the home by one, two, or several people. Though only names of activities are presented, a rather comprehensive list of references is included.

Colleges offering sports survey courses might do well to consider this book as a possible text. High school and college libraries, along with physical education departmental bookshelves, should have copies available for reference as well as a supplementary guide to teachers.

LEWIS A. HESS

Alcohol Education, a Guidebook for Teachers—By Joseph Hirsch. New York: Abelard-Schuman (381 Fourth Avenue), 1952. 107 pp. Price, $2.50.

This guidebook has been written to help teachers of teen-age groups with the difficult but important task of giving instruction on alcohol and its effects. Much of the content of the book is drawn from materials used in a course on Principles and Practices of Alcohol Education taught by the author at the School of Education, New York University.

The early chapters present a case for alcohol education and highlight the nature, action, and effects of alcohol. One chapter deals with alcoholism, while another treats problems associated with alcohol. The last third of the book provides suggestions to schools for the planning of instruction on this subject and outlines resources and materials for alcohol education. There is no attempt at completeness in this brief volume.

The author believes that preventive education should begin in the junior high school. His reason for this late beginning is that high school students who have had too much repetitive teaching in the earlier years will reject the material at a time when it should mean most to them. His assumption that alcohol problems have no particular meaning to elementary school pupils is contradicted by a recent unpublished survey in Minnesota which shows that young children, as well as the older, are asking questions of considerable depth, questions which show evidence of direct experience with and concern for alcohol problems.

Emphasis in the book is on helping students to acquire scientific data about alcohol and its dangers in such a way that they will develop a sense of responsibility toward themselves and their communities in connection with alcohol and its related problems. A variety of teaching methods is suggested. The bibliography given at the end of the book should be particularly valuable to the teacher in acquiring sound background for such instruction. The information given in the book itself should also be useful, but its documentation would have added greatly to its worth.

Despite the author's efforts to be objective, he occasionally leaves the impression that he may be prejudiced toward underestimating the damaging effects of alcohol. Some statements tend to be rather sweeping or even contradictory. For example, at one point he says "The habit-forming aspect is a psychological one and not physical, as in the case of other drugs," and two pages later he writes, "There is at least

enough experimental evidence to indicate that at some point along the drinking road the physical make-up of the individual may alter so that he ceases to be able to control his drinking." Or again, he states that most Americans "drink socially, and most of them have no difficulties and no problems in connection with their drinking."

The author is to be commended for his ability to give simple, direct answers to questions commonly raised by young people and for his plea to recognize the alcoholic as a sick person. Of special interest to public health workers is the strong case he builds up for tackling alcoholism as a public health problem and for giving greater heed to the psychological aspects of alcoholism.

RUTH E. GROUT

Growing Up—By Karl de Schweinitz (rev. ed.). New York: Macmillan (60 Fifth Avenue), 1953. 73 pp. Price, $2.25.

Growing Up begins its story about animal and human life with the one-celled egg and sperm. In simple, clear, straightforward words, the author describes the processes and amazing amount of growing which these cells accomplish to become babies. He details the roles which the male and female, father and mother, play in reproduction; compares likenesses and differences between animals and man; illustrates points with fresh and captivating photographs and diagrams, and draws freely from the tantalizing and familiar world of animals for help in clarifying elusive facts.

This is a new revised edition of a popular text originally published in 1928. It has been written primarily for boys and girls of 6–12 years of age, and presents in a balanced perspective the answers to questions which all young children ask. It is short, with large pleasant type, and suitable for the youngsters to read to themselves. Families will find it helpful as a sound approach to the story of "how we become alive, are born, and grow up."

ELINOR F. DOWNS

Insecticides—Manual of Specifications for Insecticides and for Spraying and Dusting Apparatus—World Health Organization, Geneva. New York: Columbia University Press (2960 Broadway), 1953. Looseleaf, 139 pp. Price, $8.50

This manual is an abridgment of the third and fourth reports of the WHO Expert Committee on Insecticides (WHO Technical Report Series, Nos. 46 and 54, 1952). Part I contains specifications and laboratory testing procedures for the technical grades of six chlorinated hydrocarbon insecticides and pyrethrum and for several water-dispersible powders and emulsion concentrates. Part II, concerned with spraying and dusting apparatus, contains specifications and testing procedures for equipment assemblies and component parts and accessories.

The actual specifications and tests are fully described, but valuable background information is not included. They represent the collective views of the Expert Committee and are used extensively by WHO and national governments in making purchases for global malaria and other vector control operations.

Although a valuable contribution, the manual possesses weaknesses. Some of the equipment specifications are lacking in detail or are purposely loosely drawn, due to need for further technical development studies and to avoid restricting production to a single country or a minimum number of manufacturers. The effect is to encourage procurement of unsuitable equipment, resulting in operational difficulties in underdeveloped countries.

The insecticide specifications and

tests also reflect the lack of adequate technical development studies. Current interest is centered on the widely used DDT water-dispersible powders. Suspensibility use - requirements vary greatly, depending on type of spraying equipment. Adequate laboratory tests simulating tropical storage have not yet been devised. The chemical stability and suspensibility of some wettable powders meeting these standards apparently deteriorate rapidly in tropical areas after testing.

JOHN M. HENDERSON

Chemical Methods in Industrial Hygiene — By Frederick H. Goldman and Morris B. Jacobs. New York: Interscience Publishers, Inc. (215 Fourth Avenue), 1953. 274 pp. Price, $3.75.

This book is what it says it is—a manual. It is not a detailed compendium, but will still have considerable reference value. It is not for the cookbook chemist, or the inexperienced chemist, or the chemist with special needs. Experienced chemists may feel that their favorite method has not been included. It is terse, yet very readable. Sample calculations are given. If alternative methods are described, the advantages and disadvantages of each are noted. Some alternative methods that are quite popular are mentioned only by name.

The book is well organized, covers those materials most often encountered industrially and offers time-proved methods. The accent has been placed on practicality. The authors state early that extreme analytical accuracy may not be justified on the basis of the accuracy of the field sampling procedure employed. Their recommended analytical methods keep this in mind throughout.

Shortcomings of the book are minor. The descriptions of the operation of certain field sampling devices are not up to date, such as the midget impinger pump. Footnotes and references in the text would help the reader use the bibliography more effectively.

This book will appear on the desk of most industrial hygiene chemists. It will also go into the field with many an engineer who needs a simple, readable manual that will easily fit in his coat pocket.

CLYDE M. BERRY

Living with a Disability—By Howard A. Rusk and Eugene J. Taylor (Textbook Ed.). New York: Blakiston (575 Madison Avenue), 1953. 207 pp. Price, $3.50.

This is a book full of hope and ideas and practical suggestions to turn both into reality for many people now bound to dependent living. Much of the material has been available from scattered sources to the limited group of professional workers in the field of rehabilitation. Dr. Rusk and Mr. Taylor bring together for the first time a compilation of the devices and methods developed to aid those handicapped by physical disabilities in achieving independence and an approach to a more normal and fruitful life. The materials were brought together from many sources as part of two studies sponsored, respectively, by the National Foundation for Infantile Paralysis and the Disabled Homemaker's Research Fund. The first of these projects was designed to assemble and disseminate information concerning self-help devices. The devices described and pictured in this text have been tested clinically as part of the project. The second project was developed to determine methods of accomplishing household tasks with the least expenditure of energy.

The book takes the handicapped person and his family through the basic activities of daily living, discussing various methods and devices for maximizing the ability of the disabled man or woman. There are practical sug-

gestions for cooking from a wheel chair, powdering one's nose, or shaving despite weakness or loss of an upper extremity, and fishing, despite paralysed fingers, or running power woodworking tools, despite paraplegia.

It should be emphasized that the book is directed to the patient and his family; it will, nevertheless, be a most helpful resource for all health workers who see disabled people. Its thoughtful comments on giving and taking advice are particularly appropriate.

It is to be hoped that in future editions photographs will be less crowded and better labeled and that more working diagrams with scale drawings will be included. Although most of the photographs are good ones, a few are blurred and should either be removed or replaced. There is certainly need for more detail on the construction of many of the gadgets and on how to obtain information as to the availability and cost.

JONAS N. MULLER

Health Services for the Child — By Edward R. Schlesinger. New York: McGraw-Hill (330 West 42nd St.), 1953. 403 pp. Price, $7.50.

For the first time we have a volume which interprets the principles and technics used in community health services for mothers and children. Dr. Schlesinger describes the basic considerations for these services. This includes a discussion of the purpose of the community child health program, the relationship of the practicing physician thereto, and the community health council's role. There is a concise review of trends in child morbidity and mortality and an historical review of the growth and development of child health services in this country.

Those concerned with the administration not only of child health programs but of any type of community health and welfare service will find the chapter on administrative relationships rewarding, and for students it will be orienting.

In the section concerned with essential health services and health supervision, as well as special problems such as programs for children with physical handicaps and intellectual, emotional, and social handicaps, the author has skillfully blended up-to-date clinical knowledge with discussion of the administrative devices and plans necessary to insure both quality and quantity in these community services.

The book is a must for students and workers in child health programs. It will also give physicians of the community, especially family doctors, considerable insight into the child health work done by health departments and other community agencies and also more awareness of the knowledge and skill used to plan these programs so that they complement the services of the private practitioner. Understanding and application of the concepts presented in this volume will greatly strengthen health services for children.

The book is well organized and well written. The index is quite complete and the references at the end of each chapter are pertinent and up to date.

GEORGE M. WHEATLEY

Adventures in Artificial Respiration —By Peter V. Karpovich. New York: Association Press (291 Broadway), 1953. 303 pp. Price, $7.50.

Records of history in science are most interesting and often most illuminating when they include side-delights beyond the core of scientific findings. An extensive section of this book is devoted to the history of artificial respiration, the large number of methods proposed, the leading personalities involved, and something of the controversies. Several chapters deal with the immediate scientific evidence and developments leading recently to the selection of the

back pressure-arm lift (Nielsen) method. Public health workers might wish for a section on the spadework underlying the cooperative, simultaneous acceptance by the scientists and virtually all industrial and teaching organizations of the method, because the force of scientific findings often is not sufficient to resolve controversies alone.

There is a rather elementary discussion of normal respiration, the book being directed at lay people, evidently, as well as at others. Account is not taken of recent concepts related to the Hering-Breuer reflex. The mass teaching of artificial respiration is discussed, as is the minor problem of injuries caused by the procedure and revival from apparent death. Much of the information has been condensed in carefully prepared tables and the book is profusely illustrated.

With increasing emphasis upon the accident problem, this readable book should be of interest to public health workers and others dealing with safety and first aid.

CARL J. POTTHOFF

Books Received

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ADD LIFE TO YOUR YEARS. Ernst Boas. New York: McBride, 1954. 278 pp. Price, $3.75.

ADMINISTRATIVE MEDICINE. TRANSACTIONS OF THE FIRST CONFERENCE MARCH 9–11, 1953. New York: Josiah Macy, Jr. Foundation, 1953. 176 pp. Price, $3.00.

ACCEPTED DENTAL REMEDIES (19th ed.). Chicago, Ill.: American Dental Association, 1954. 207 pp. Price, $2.00.

BREAKING PATTERNS OF DEFEAT. Richard L. Jenkins. Philadelphia, Pa.: Lippincott, 1954. 270 pp. Price, $6.75.

CHILD, HIS PARENTS AND THE NURSE, THE. Florence G. Blake. Philadelphia, Pa.: Lippincott, 1954. 440 pp. Price, $5.00.

COMMUNITY ORGANIZATION AND DEVELOPMENT IN SOUTH AND SOUTHEAST ASIA, REPORT OF THE MISSION ON. Prepared for the Technical Assistance Administration of the United Nations by Horace Belshaw and John B. Grant. New York: Columbia University Press, 1953. 167 pp. Price, $2.50.

CONNECTIVE TISSUES. TRANSACTIONS OF THE FOURTH CONFERENCE, FEBRUARY 18–20, 1953. Charles Ragam. New York: Josiah Macy, Jr. Foundation, 1953. 197 pp. Price, $3.75.

DIRECTORY OF PUBLIC HEALTH STATISTICIANS. Compiled by the Statistics Section of the American Public Health Association. New York: American Public Health Association, 1953. 48 pp. Price, $1.00.

ELEVEN BLUE MEN AND OTHER NARRATIVES OF MEDICAL DETECTION. Berton Roueche. Boston, Mass.: Little, Brown, 1954. 215 pp. Price, $3.50.

FATHER RELATIONS ON WAR-BORN CHILDREN. Lois Meek Stolz. Stanford, Calif.: Stanford University Press, 1954. 365 pp. Price, $4.00.

FINANCING HOSPITAL CARE IN THE UNITED STATES — SUMMARY REPORTS. RECOMMENDATIONS OF THE COMMISSION ON FINANCING OF HOSPITAL CARE. Vol. I. RECOMMENDATIONS. Vol. II. PREPAYMENT AND THE COMMUNITY. Vol. III. FINANCING HOSPITAL CARE FOR NON-WAGE AND LOW INCOME GROUPS. Vol. IV. FACTORS AFFECTING THE COSTS OF HOSPITAL CARE. These volumes will be published by the Blakiston Company, New York, N. Y., in the spring and summer of 1954.

GLOBAL EPIDEMIOLOGY. Vol. III. The Near and Middle East. James Stevens Simmons, et al. Philadelphia: Lippincott, 1954. 357 pp. Price, $12.00.

HANDBOOK OF BASIC DOCUMENTS—INCLUDING AMENDMENTS APPROVED BY THE SIXTH WORLD HEALTH ASSEMBLY, MAY 1953 (6th ed.). New York: Columbia University Press, 1953. 212 pp. Price, $1.00.

HOME ACCIDENT PREVENTION. PROCEEDINGS OF THE FIRST CONFERENCE — JANUARY 20–22, 1953. Conducted by the School of Public Health in cooperation with U. S. Public Health Service, National Safety Council,

American Public Health Association, and the W. K. Kellogg Foundation. Ann Arbor, Mich.: University of Michigan Press, 1953. 148 pp. Price, $1.00.

INTRODUCTION TO LABORATORY TECHNIQUE IN BACTERIOLOGY, AN. Max Levine (3rd ed.). New York: Macmillan, 1954. 413 pp. Price, $4.50.

LIVING YOUR LATER YEARS. Kenneth Walker. New York: Oxford University Press, 1954. 196 pp. Price, $3.50.

MODERN CONCEPTS OF LEPROSY. AMERICAN LECTURE SERIES PUBLICATION NO. 145. Harry L. Arnold, Jr. Springfield, Ill.: Thomas, 1953. Price, $3.75.

MOTION OF THE HEART, THE. Blake Cabot. New York: Harper, 1954. 173 pp. Price, $2.00.

MUSIC THERAPY. Edward Podolsky. New York: Philosophical Library, 1954. 335 pp. Price, $6.00.

NEEDS OF OLDER PEOPLE, THE, AND PUBLIC WELFARE SERVICES TO MEET THEM. Elizabeth Wickenden for the Committee on Aging. Chicago, Ill.: American Public Welfare Association, 1953. 148 pp. Price, $2.00.

NUTRITION. Margaret S. Chaney (5th ed.). Boston: Houghton Mifflin, 1954. 484 pp. Price, $4.50.

PRE-ADOLESCENT EXCEPTIONAL CHILD, THE. PROCEEDINGS OF THE 35TH CONFERENCE OF THE CHILD RESEARCH CLINIC OF THE WOODS SCHOOLS, PHILADELPHIA, PA., MAY 23, 1953. Langhorne, Pa.: Child Research Clinic of the Woods Schools, 1954. 70 pp. Free.

PROCESS OF PSYCHOTHERAPY, THE. Harrington V. Ingham and Leonore R. Love. New York: McGraw-Hill, 1954. 270 pp. Price, $5.00.

PSYCHOLOGY IN THE NURSERY SCHOOL. Nelly Wolffheim. Translated by Charles L. Hannam. New York: Philosophical Library, 1953. 144 pp. Price, $3.75.

REHABILITATION OF THE HANDICAPPED. SOCIAL WELFARE INFORMATION SERIES — SPECIAL ISSUE, SEPTEMBER, 1953. New York: United Nations, Department of Social Affairs, Social Reference Centre, 1953. 85 pp.

SARDINIAN PROJECT, THE. AN EXPERIMENT IN THE ERADICATION OF AN INDIGENOUS MALARIOUS VECTOR. John A. Logan. Baltimore, Md.: Johns Hopkins Press, 1953. 415 pp. Price, $7.50.

SOCIAL WORK YEAR BOOK 1954. Russell H. Kurtz, Editor. New York: American Association of Social Workers, 1953. 703 pp. Price, $6.00.

TV A NEW COMMUNITY RESOURCE. THE STORY OF A TELEVISION WORKSHOP FOR COMMUNITY ORGANIZATION PERSONNEL. Leonia, N. J.: Wells Publishing, 1953. 96 pp. Price, $1.00.

A Selected Public Health Bibliography with Annotations

School Children's Eyes—A broadly representative committee recommends methods for school child vision screening, to be carried out by instructed teachers or nurses, to be given annually, and to be followed by eye examinations when the need is indicated.

ANON. Standards for Referral of School Children for an Eye Examination. Sight-Saving Rev. 23, 4:223 (Winter), 1953.

Health Services for Doctors?—Physicians do not have as good a health record as others of the professional executive group—clergymen, bankers, et al. Has traditional occupational hygiene anything to offer, preventivewise, to physicians themselves? Some investigation into this possibility is earnestly called for, concludes the writer.

ABRAMS, H. K. The Doctor's Health. GP 9, 1:36 (Jan.), 1954.

Still Needed—Based on the writer's experience and the testimony of others, a good case is made for tuberculin testing—and x-raying reactors—among both school children and school staffs.

Those who failed to attend the school health sessions of the recent New York Annual Meeting will want to look up this reminder.

AYLING, W. E. Tuberculosis Case Finding in Schools. J. School Health 23, 10:293 (Dec.), 1953.

Influencing Fatties' Behavior—Individually interviewed and guided obese persons were compared, after a one- or two-year interval with a similar number of graduates from a group therapy reducing project. The findings are discouraging but not surprising, the reporters tell us.

BOWSER, L. J., et al. Methods of Reducing (see also) MUNVES, E. D. Dietetic Interview or Group Discussion—Decision on Reducing. J. Am. Dietet. A. 29, 12:1193 (Dec.), 1953.

Past Polio Research—Here is an inclusive account of the important researches in experimental immunization against poliomyelitis, up to midyear 1953. The paper's purpose is to allow the reader to judge for himself the significance of the many, many independent contributions, some highly valuable, some less so. A 100-page documentation with an extensive bibliography.

BOYD, T. E. Immunization Against Poliomyelitis. Bact. Rev. 17, 4:339 Supp. (Dec.), 1953.

Social Medicine Dissected—A generally sympathetic commentary on the current plight of the British M.O.H., offers this conclusion: "although many of the changes (in public health services) are identified with circumstances local and peculiar to the British scene, there are many others that attract universal interest."

CLARK, D. W. Preventive and Social Medicine in Great Britain. New York State J. Med. 53, 24; 2953 (Dec. 15), 1953.

So You Want to Write a Book!—Instead of advising you not to, this experienced writer gives you a lot of practical advice about getting your book accepted and published, if you persist in your mad intention.

DEMING, D. "There Should Be a Book—" Am. J. Nursing 54, 1:57 (Jan.), 1954.

Agency Voice — With Smile — Every staff member who answers the agency phone, even occasionally, thereby becomes a member of the public relations department, for public relations begin at the first tinkle of the bell. What happens after that first ring becomes a matter of serious concern to the agency, a matter handled deftly and briefly in these telephone tips.

FULLERTON, R. Your Perfect, Permanent Assistant—How to Get the Most from It. GP 9, 1:112 (Jan.), 1954.

Advertiser Points Way—For advertising and advertiser, the words health education and educator are substituted in this slightly paraphrased quotation: "There are two ways to educate. The educator can tell the person to take the product because it will do this or that for him. Or, the educator can create a friendly, understanding atmosphere which shows the benefit of the product . . . enabling the educatee to accept new ideas without threat to his old ideas." As all health workers are educators there is an idea here that all of us might expose ourselves to. (Observe this horrible example of educator telling "person to take the product because," etc.)

HADLEY, H. D. The Non-Directive Approach to Advertising Appeal. J. Applied Psychol. 37, 6:496 (Dec.), 1953.

Is There a Therapeutic Dentifrice?—Are you wondering if—at very long last—there may be some truth in back of the high-powered medicated dentifrice advertising? This is culled from a fine symposium: ". . . many variables exist which lead to sources of error . . . both positive and negative results concerning effects of medicated

dentifrices appear in the literature . . . Enzyme inhibitors should be effective . . . clinical experiments (with them) are being carried out and preliminary results are encouraging." So the answer to your question seems to be: we will have to wait to see.

Hill, T. J., et al. Therapeutic Dentifrices: Panel Discussion. J. Am. Dent. A. 48, 1:1 (Jan.), 1954.

Solace for Smokers—". . . existing evidence neither proves nor strongly indicates that tobacco smoking, and especially cigarette smoking, represents a major or even a predominating causal factor in the production of cancers of the respiratory tract . . ."

Hueper, W. C. Lung Cancer and the Tobacco Smoking Habit. Indust. Med. & Surg. 23, 1:13 (Jan.), 1954

What's Newest in Nutrition?—The observer seemingly most advantageously placed to get a world-encompassing view of nutritional research gives us another briefing on what is currently being clarified by scientific studies. You will like this: "The old phrase of derision, 'he has a fat chance' has become applicable with striking reality to the 25 million members of our community who are overweight and are therefore poorly fed."

King, C. G. Recent Research in Nutrition. J. Am. Dietet. A. 30, 1:13 (Jan.), 1954.

Lysogeny — Power to Produce Bacteriophage — Most of this long paper on the history of bacteriophage and an orientation in current research offered to readers "having a good knowledge of bacteriophage" — will prove heavy going for others. Quite evidently it is an important document and so worth your effort to master it.

Lwoff, A. Lysogeny. Bact. Rev. 17, 4:269 (Dec.). 1953.

Where Vaccination "Is Not Advised"—Long and painful is this "honest and accurate account" of a (British) smallpox epidemic which began with a misdiagnosis of generalized herpes and went on to include some fatal hemorrhagic smallpox; it put some innocent general practitioners to bed and ended — eventually — with the son and daughter of a mortuary attendant as its last victims. Despite all that was done to discourage mass vaccination, long queues of people persisted in lining up each day to be protected.

Lyons, J., and Dixon, C. W. Smallpox in the Industrial Pennines, 1953. M. Officer 90, 25:293 (Dec. 19), 1953.

They Finish the Job—In Buffalo (N. Y.) the Public Health Department's school health service does more than screen children for defects. With voluntary agency help, children with possible signs of heart disease are seen by a specialist who examines each child and talks with parents. In this way parents are not needlessly scared to death, and family physicians needlessly irritated, as both usually are, when in the course of the customary screening suspected heart conditions are found later not to exist.

Mattison, B. F., et al. Cardiac Screening in a School Health Program. New York State J. Med. 53, 24:2966 (Dec. 15), 1950.

Like the Good Old Days—Just to remind you that it can still happen here, an old-fashioned typhoid fever epidemic is called to your attention.

McMahon, D. P., and Hartnagel, A. C. An Outbreak of Typhoid Fever in a Rural New York Community. New York State J. Med. 53, 24:2962 (Dec.), 1953.

Discouraging but Not Futile—From a follow-up of lung cancer cases picked up in a mass (TB) chest x-ray survey comes this comment: "A single survey can have no significant effect on the control of cancer. (But) when such screening can be carried out as part of existing routines . . . its use should be encouraged and expanded."

McNULTY, J. M. Clinical Follow-Up Study of 398 Patients Suspected of Having Lung Cancer Discovered in the Boston Chest X-Ray Survey. New England J. Med. 250, 1:14 (Jan. 7), 1954.

Stateswoman—A clipping you may want for your "Biographies" file is this two-part story of the only one of the original founders of the NOPHN who survived to take part in its metamorphosis—when it became the NLN. A very human document as well as one historically significant.

NELSON, S. C. Mary Sewall Gardner. Nursing Outlook 1, 12:668 (Dec.), 1953.

Lucky Richlanders—In a young, isolated industrial community (in Washington State) a well integrated program of public health, prepaid hospital and medical insurance, and a vigorous industrial medical service is producing some phenomenal results in health promotion, chalking up adjusted mortality rates half those of the state and nation.

NORWOOD, W. D. Community Health Planning. J.A.M.A. 154, 1:44 (Jan. 2), 1954.

Success Story—A step-by-step account of the prolonged negotiations between Pittsburgh's Health Department and nursing association leading to a joint nursing service in which one nurse does generalized nursing in a district of from 5,500 to 8,000 people. Nurses from both agencies are reported to be satisfied: they would not want to go back to the old plan.

WILSON, A. B., et al. Pittsburgh's Combined Nursing Service. Nursing Outlook 1, 12:671 (Dec.), 1953.

If additional information is desired regarding the articles listed in this Bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Am. J. Nursing (American Journal of Nursing), 2 Park Avenue, New York 16, N. Y.
Bact. Rev. (Bacteriological Reviews), Williams and Wilkins Company, Mt. Royal and Guilford Aves., Baltimore 2, Md.
GP, American Academy of General Practice, Broadway at 34th St., Kansas City, Kans.
Indust. Med. & Surg. (Industrial Medicine and Surgery), 605 N. Michigan Ave, Chicago 11, Ill.
J. Am. Dent. A. (Journal of the American Dental Association), 222 E. Superior St., Chicago, Ill.
J. Am. Dietet. A. (Journal of the American Dietetic Association), 620 N. Michigan Ave., Chicago, Ill.
J.A.M.A. (Journal of the American Medical Association), 535 N. Dearborn St., Chicago, Ill.
J. Applied Psychol. (Journal of Applied Psychology), American Psychological Association, 1515 Massachusetts Ave., N.W., Washington 5, D. C.
J. School Health (Journal of School Health), American School Health Association, 3335 Main St., Buffalo 14, N. Y.
M. Officer (Medical Officer), Whitefriars House, 72-78 Fleet St., London, E.C. 4, England.
New England J. Med. (New England Journal of Medicine), Massachusetts Medical Society, 8 The Fenway, Boston 15, Mass.
New York State J. Med. (New York State Journal of Medicine), 292 Madison Ave., New York 17, N. Y.
Nursing Outlook, American Journal of Nursing Company, 2 Park Ave., New York 16, N. Y.
Sight-Saving Rev. (Sight-Saving Review), National Society for the Prevention of Blindness, Inc., 1790 Broadway, New York 19, N. Y.

Association News

Fifth Directory of Statisticians

The Statistics Section of the Association has recently published its Fifth Directory of Public Health Statisticians. It contains a total of 1,441 names of "persons actively engaged in the collection, processing, analysis, or publication of public health statistics, including vital statistics and medical statistics." The names were "submitted by the keymen in each area cooperating with the Committee on Membership and Directory." Of the total, one-third are members or Fellows of the Statistics Section, APHA, and an additional 12 per cent are members or Fellows of other sections.

The directory includes an alphabetical listing, as well as a geographical and agency listing, and indication of APHA membership or fellowship. It has been mailed to members and Fellows of the section without charge and is available to nonmembers for a dollar.

An interesting aspect of this directory is the complete responsibility the section membership itself took for its preparation up to the point of reproduction. A seven-man Committee on Membership and Directory was chaired by Clifford H. Greve, who carried a lion's share of the load. In addition, acknowledgment for "assistance received in the preparation of the directory" is made to 76 persons "who furnished the information for their respective areas or agencies." One of the uses to which the section expects to put its directory is as a resource for the Membership Committee.

The first edition, then entitled Vital Statistics Directory, was published in 1935 and contained nearly 500 names, about one-third the current issue. The growth in membership in the section has followed about the same trend; the present membership is slightly more than three times what it was in 1935. A table in the directory shows section membership for nearly all of the years since 1911, two years after its organization. In 1913 there were 155 members, a figure not reached again until 1936. In 1938 members and Fellows numbered 220; by 1945 the 300 mark had been reached, and by 1947—the 400 mark. In the last five years the figure has been nearly 500.

Another New PES Examination

The Professional Examination Service has just announced an examination for the licensing of physical therapists. The examination was prepared jointly by a committee of the American Physical Therapy Association and the Professional Examination Service.

It will be made available to state agencies responsible for licensing physical therapists. Considerable interest in the examination has already been expressed by several state agencies. The development of this examination is a result of the recent decision of the Professional Examination Service to develop examinations for licensing in several fields. Five state boards are currently using an objective examination for medical licensing; one state board is experimenting with an examination in the basic sciences.

Helping Arizona Secure a New Law

At the request of Governor Pyle and the Subcommittee on Tuberculosis and Public Health of the House of Representatives, the Association's field director, Roscoe P. Kandle, M.D., has been assisting the State of Arizona in preparing the draft of a new basic

public health law and an amendment to the act relating to local health services. This revision is related to the Mirana Decision of the State Supreme Court which declared unconstitutional much of the former act outlining the powers of the Board of Health and particularly its powers to make sanitary regulations. Copies of the Mirana Decision are available without charge from the Association office.

The Legislature of Arizona, acting in Special Session in November, appropriated an additional $45,000 for the Department of Health to replace in part the loss of funds due to cuts in the federal grant-in-aid moneys.

University of Montreal Accredited for D.P.H.

The University of Montreal School of Hygiene, Montreal, P.Q., has been accredited to give the Diploma of Public Health for the year 1953–1954, making the twelfth institution in North America so listed by the American Public Health Association and the second in Canada. Accreditation was voted by the Executive Board of the Association upon unanimous recommendation of the Committee on Professional Education. Two visits were made to the University of Montreal before action, by Drs. Reginald M. Atwater and Wilson G. Smillie as representatives of the Association.

The University of Montreal is the only institution of its kind giving a rounded course of the North American variety in the French language. It is being used for training French-speaking nationals by the World Health Organization. The director of the school is Armand Frappier, M.D., D.P.H. Jules Gilbert, M.D., D.P.H. is the secretary.

APHA membership application blank on page XXXV

Employment Service

The following pages present information for those seeking public health personnel and for those seeking positions in public health.

This is a service of the Association conducted without expense to the employer or employee.

POSITIONS AVAILABLE

Chemist—For Vermont State Department of Health, Bureau of Laboratories. Experience of one year in chemistry and master's degree in chemistry or related chemical sciences required. Personnel Officer, Dept. of Health, 115 Colchester Ave., Burlington, Vt.

Public Health Nurse—with certificate. Generalized program in urban and rural communities. San Francisco Bay Area. $339–$414. Director of Public Health Nursing, Alameda County Health Dept., 576 Callan Ave., San Leandro, Calif.

Public Health Nurses — Generalized program, semirural county of 40,000 in tidewater area of North Carolina. Merit system, hospitalization, and retirement plans. 15 days vacation. $2,640–$4,140 according to qualifications; $60 per month travel allowance. **Box M-12,** Employment Service, APHA.

Public Health Nurse — for generalized program, including school nursing. Rural and urban areas in a Northern California college town. $315–$391, depending upon experience and qualifications. County car furnished or eight cents per mile. Richard C. Murphy, M.D., Butte County Health Dept., 2430 Bird St., Oroville, Calif.

Public Health Nurses—Generalized and MCH consultants for state level positions. Consultative work; no supervisory responsibilities. Four years' responsible nursing experience. Bachelor's degree required; master's desirable. $394. A. T. Johnson, Personnel Director, Oregon State Board of Health, P.O. Box 231, Portland, Ore.

Public Health Nurse—Experience not essential but preferred. Inservice training, large city-county health unit. $3,500–$4,000. Social Security. Immediate appointment. Director, Kalamazoo City-County Health Dept., 241 W. South St., Kalamazoo, Mich.

Public Health Nurse — Qualified registered nurses. Must be residents of Newark, N. J. Salary to start $3,400 per annum. Bureau of Health, Child Hygiene Division, 94 William St., Newark, N. J. Tel. Market 4-6400.

Public Health Nurses—$4,205–$4,955 and **Junior Public Health Nurses**—$3,795–$4,545. Mrs. J. P. Prescott, Director, Bureau of Public Health Nursing, Dept. of Public Health, 300 Indiana Ave., N.W., Washington 1, D. C.

Supervising Nurse — Central Illinois county health department. Generalized program. McLean County Health Dept., 318 E. Locust, Bloomington, Ill.

Public Health Nurses—Two, immediately for generalized program in large rural counties. $290–$330. (Possible increase after July 1, 1954). Fifteen days vacation; 7½ cents per mile car allowance. Minimum requirement: certificate in public health nursing or completion of at least one year of public health nursing education in an accredited course. State Supervisory Nurse, Nevada State Dept. of Health, 506 Humboldt St., Reno, Nev.

Director—Department of nursing for 175-bed tuberculosis hospital. Minimum qualifications: B. S. degree, one year's teaching experience and knowledge of public health. Hospital approved as training school for physicians and student nurses. Salary open. Dr. H. H. Teitelbaum, Mahoning Tuberculosis Sanatorium, 4880 Kirk Road, Youngstown, Ohio.

Assistant Librarian—(Medicine) Division of Laboratories and Research, New York State Department of Health, Albany. Primary requirement, cataloging; experience in bibliographic research desirable. $4,053–$4,889; merit system and retirement plan. Written examination open to nonresidents of New York State will be held at centers convenient to candidates about May 1. Eligibility list may be used by other departments. New York State Civil Service Dept., Albany, N. Y.

Physician—California licensed for health department tuberculosis clinic. Requirements: minimum of two years' experience in diagnosis and treatment, or both, of tuberculous patients; age limit 54. $786 (40-hour week).

Health Educator—Between 21 and 54; M.P.H. in health education with three months of supervised field training from a school of public health and one year of experience in public health education. $397–$460.

Dental Hygienist—California licensed for county health department preventive dental program, cooperating with local dentists, public health staff, and nurses in communities and schools. $327–$360.

Dentist—California licensed. Full-time permanent health department position with mobile unit. $532–$587. San Diego County Civil Service, 402 Civic Center, San Diego, Calif.

Public Health Physician—(Maternal and child health) Wayne County Health Department (exclusive of Detroit). Population 600,000. $10,149–$10,749. Diagnose and treat children's diseases, consult with private physicians and hospitals, and administer an educational program among lay groups. U. S. citizen, with at least one year's residence in obstetrics or pediatrics in an approved hospital. Michigan medical license required at time of appointment. Wayne County Civil Service Commission, 2200 Cadillac Tower, Detroit 26, Mich.

Public Health Educator Vacancies—For Philadelphia, Department of Public Health.

Director—$6,783–$8,520. Complete responsibility for administration of a comprehensive public health education program. Requirements: B.S. or A.B., supplemented by graduate courses in public health or public health education to the level of a master's degree, and four years' experience in educational and promotional work in an organized public health program, including two years in a supervisory capacity, or equivalent.

Public Health Educator II—$5,160–$6,480. Responsibility for adult education and community organization aspects of a public health education program. Requirements: B.S. or A.B., supplemented by 16 semester hours of graduate work in public health or public health education, and two years' experience in educational and promotional work in an organized public health program, or equivalent.

Public Health Educator I—$4,108–$5,160. Develop and execute health education program in an assigned health district. Requirements: B.S. or B.A. with major course work in education, journalism, health, or related fields; one year of experience in educational or promotional work related to family health or welfare, or equivalent. File by April 1, 1954, Personnel Dept., Room 127, City Hall, Philadelphia, Pa.

Health Officer—for Napa County; Population 55,000 in rural county. Salary open; California license and M.P.H. required and experience desirable. Dr. R. S. Westphal, P.O. Box 749, Napa, Calif.

Administrative Assistant to Montgomery County Health Officer. Appointment in Grade 15, 16, or 17; $4,410–$5,250, $4,830–$5,754, or $5,250–$6,258, depending on qualifications. Minimum requirements: bachelor's degree in public health, public administration, or business administration. Experience in public health administration desirable. County Office Building, Rockville, Md.

Executive Director—For Crippled Children's Society (Easter Seal), in midwestern state. Open June 1. Degree in educational and social welfare work, or both, required. Graduate level preferred. Experience in group health and welfare or educational work necessary. Experience in work with handicapped preferred. $7,000–$8,500. **Box HE-61,** Employment Service, APHA.

Dental Hygienist—for dental hygiene program in schools of Contra Costa County, Calif. California license and completion of four-year college curriculum in dental hygiene or completion of two-year curriculum with two years' practical experience. $341–$410. Contra Costa County Civil Service Commission, Box 710, Martinez, Calif.

Sanitary Engineer — Required immediately by the Health Department of the City of Ottawa, Canada. Permanent position. Hospital and medical insurance plans available. State qualifications, experience, and salary expected. Secretary, Board of Health, Transportation Bldg., Ottawa, Canada.

Sanitary Engineer — Permanent position in state health department. $5,044–$7,202, depending upon qualifications. Personnel Officer, Vermont Health Dept., 115 Colchester Ave., Burlington, Vt.

Sanitarian — College graduate with registration or eligible for registration in California. $323. Rural area. Every phase of sanitation work. Herbert Bauer, M.D., Health Officer, Yolo County Health Dept., Woodland, Calif.

Sanitarian—For city health department; population 73,827. $328–$393. Civil Service and covered by State Retirement Act. California registration required. Successful applicant must establish residency in city. James W. Moreland, M.D., City Health Officer, Room 110, City Hall, San Bernardino, Calif.

Sanitarian—for broad program in city of 77,000. $346–$395 per month. Transportation, hospital, and surgical insurance provided. Commissioner of Health, 730 Washington Ave., Racine, Wis.

Public Health Statistician—Chief of the Bureau of Health Statistics, Honolulu, T.H. $6,400–$7,400. Six years' statistical experience; three years in supervisory capacity in a public health program and M.P.H. with emphasis on public health statistics, or an additional year of experience in a public health program. Richard K. C. Lee, M.D., President, Board of Health, P.O. Box 3378, Honolulu 1, Hawaii.

Biostatistician—For medical school teaching and consultation. At least a master's degree required. Salary and rank dependent on education and experience. Huldah Bancroft, Ph.D., Tulane University School of Medicine, 1430 Tulane Ave., New Orleans, La.

POSITIONS WANTED

Biochemist, Microbiologist, and Bacteriologist—M. S., 39, married, family. Fifteen years' experience, in industry, research, and government. Administration, organization, supervision, publications, nutrition, food, dairy, sanitation, and public health. Mechanical proficiency. At present, department head, research laboratory. Salary $7,000. **Box L-33,** Employment Service, APHA.

Bacteriologist—Ph.D. wants academic appointment. Experience in state, overseas medical, and hospital laboratories; also teaching and research. **Box L-32,** Employment Service, APHA.

Public Health Physician—Diplomate and M.P.H. in early 40's with administrative experience at county, city, and state levels and teaching public health in medical school. Prefers a position offering some teaching opportunity. **Box PH-44,** Employment Service, APHA.

Ph.D. in bacteriology and M.S. in public health. More than 15 years' experience in public health laboratory work, technical and supervisory at the state level, desires a position as **Director or Assistant Director** in a public health laboratory, preferably in the Eastern United States. **Box L-31,** Employment Service, APHA.

Sanitarian—British trained, certified by the Royal Sanitary Institute, 22 years of practical experience in Far East and South America Specialities: sanitation, meat, milk and food inspection, and malaria, insect, and rodent control. Location not important. Speak and write fluently English, Spanish, Russian, and Polish, **Box S-20,** Employment Service, APHA.

All communications on the following advertisements should be sent to Burneice Larson, Medical Bureau, Palmolive Building, Chicago 11, Ill.

OPPORTUNITIES AVAILABLE

WANTED: (a) Public health physician to direct health program, U. S. dependency; minimum $12,000. (b) Physician to head university health service; 5,000 students. (c) Director, school health program; large city; Midwest. (d) Public health nursing director; duties: planning, directing wide variety of public health and clinical nursing activities as part of city-wide health program; degree, extensive experience, administrative ability required; $6,400 increasing to $7,700. (e) Staff and two supervisors; county department; California; cars provided. (f) Statistician to serve as assistant or associate professor, university school of medicine. (g) Health educator; assist county health officer; East. (h) Health educator experienced in working with the handicapped, older persons; key post, health agency; $7,500–$9,000. (i) Industrial hygienist; leading casualty insurance company. (j) Sanitarian; county health department; Midwest. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

OPPORTUNITIES WANTED

(a) Public health physician; M.P.H.; Hopkins; Diplomate; seven years, director, metropolitan health department. (b) Public health nursing administrator; M.A.; six years, director nursing, state health department. (c) Health educator; M.S., D.P.H.; five years' teaching; seven years' educator, state health department. (d) Sanitarian; B.S. four years, sanitarian, state health department. (e) Industrial hygienist; M.S.; eight years, chief, state department, and assistant professor public health, medical school. (f) Statistician; Dr.P.H. (public health research, statistics); eleven years, director, state department, vital and public health statistics. Burneice Larson, Medical Bureau, Palmolive Building, Chicago.

News from the Field

WHO News

April 7 Is Sixth World Health Day

"The Nurse, Pioneer of Health," is the theme of the 1954 World Health Day, which will be observed on April 7, in commemoration of the founding of WHO in 1948. In thus directing attention to the importance of the nurse in the work of WHO, tribute is being paid to Florence Nightingale, "the great pioneer of the nursing profession." She developed "most of the principles on which modern nursing is based and which guide WHO's work in that field . . . 'The loving heart is not enough; for the art of caring for the sick, the knowledge of the laws of life and death, are matters of sufficient importance and difficulty to require learning by experience and careful inquiry.'"

WHO, now comprising 84 member and associate member countries, is the largest employer of nurses for international work. There are presently about 140 nurses of 22 different nationalities working on WHO projects in 31 countries. Nurses are most needed for public health nursing, including midwifery, pediatric, and medical and surgical nursing. Qualifications are very precise: training as a registered nurse, postgraduate work and at least two years' experience in one of the above specialties. Personal qualities of flexibility, genuine love of people, health, and humor are also important.

WHO has prepared a kit of addresses suitable for use in developing local World Health Day programs. Among them is a manuscript, "The Nurse, Pioneer of Health," especially written for World Health Day by Dr. René Sand, just before his death in August, 1953. He sums up with "The nurse is indeed the sentinel of health." Other messages are from the director-general of the International Labor Organization calling on its 66 member governments to collaborate in observing World Health Day, by the chief of the WHO nursing section, by the executive secretary of the International Council of Nurses, and others. "Florence Nightingale — International Pioneer" is contributed by the director of the Nightingale International Foundation and "Foolish Friends in the Sickroom" is excerpted from Florence Nightingale's Notes on Nursing. The kit is available from the Information Section of the Washington, D. C., office of WHO, the Pan American Sanitary Bureau, 1501 New Hampshire Ave.

Medical Examinations for Migrants

In December, 1953, a group of 13 doctors from as many interested countries met in Geneva to discuss the medical selection of migrants. The meeting was held jointly by WHO, the International Labor Organization, and the Intergovernmental Committee for European Migration. Among the principles suggested in the report of the meeting are:

1. The potential usefulness of a migrant does not depend on medical considerations alone and medical criteria should not be rigid.
2. Physical examinations should be given a migrant's family before his departure, to insure that they will not be denied entry for health reasons.

One proposal made was that medical examinations should be related to the work for which migrants are selected. Thus the report includes a list of physical infirmities that are compatible with specific work and others that are not. One list is for migrants designed for normal employment, another for stren-

uous occupations or those requiring special physical aptitudes, such as mining, construction, and precision engineering.

The report is being sent to their member states by the three organizations as a guide in selecting migrants. The report or more detailed information concerning it is available from the International Labor Office, 1262 New Hampshire Ave., Washington, D. C.

Water Purification Seminar

Because of the critical importance of pure water supplies in prevention of several of the most serious mass diseases common to most parts of southeast Asia, the WHO Regional Office in New Delhi, India, and the Indian Ministry of Health scheduled a two-week seminar on water purification and distribution in New Delhi in December. Serving as a refresher course for waterworks operators, it was hoped that the seminar would result in more effective use and maintenance of existing plants in urban centers. It has been found that even well equipped water purification and distribution systems often do not work efficiently because of improper operation or faulty maintenance. Waterworks operators from Burma, Ceylon, India, and Indonesia attended the seminar. Lectures were given by experts from India, the Netherlands, WHO, and the U. S. Technical Cooperation Administration.

UNICEF News

Milk Powder to Japan—To meet the desperate situation among families in crop shortage areas of northern Japan where child selling had been revived, UNICEF through a mail poll of its board made an emergency allocation of $132,000 in December. This will provide skim milk powder for nearly a million children. The area in central Japan struck by the typhoon is included in the emergency allocation.

Local Milk Production Stimulated—Speaking in London to the Society of Dairy Technology in December, UNICEF's milk conservation coordinator, Donald R. Sabin, reported that "vast new areas of dairying are being stimulated in trying to meet the essential needs of children." UNICEF commitments of approximately $8,000,000 in 23 countries of the world to establish drying, pasteurizing, or sterilizing plants have stimulated government investments of five times that amount for capital and other costs and an additional million dollars to provide free milk for children. He estimated further that about 2,000,000 children had been aided with facilities already installed and that the number would rise to 3,300,000 when all authorized plants go into full production.

50 Countries Contribute to UNICEF—Fifty governments, the largest number in a single year, in 1953 contributed more than $14,000,000 to UNICEF. In 1950, the first year of UNICEF, 30 governments contributed nearly $8,000,000.

UNICEF-aided Penicillin Plant—After a two-and-a-half-year effort, what is said to be the first penicillin plant equipped with the aid of UNICEF started operation in Belgrade in January, 1954. In order to modernize Yugoslavia's production of penicillin, UNICEF contributed $90,000 worth of basic production equipment, WHO trained technicians under its technical assistance program, while the government itself is spending $500,000 for salaries of plant personnel in order to make penicillin available cost-free to mothers and children throughout the country.

Also in Chile and India, UNICEF is helping to develop penicillin plants. In all three countries UNICEF is spending a million and a quarter dollars and the three governments are spending five and a half million dollars. The plant in

India will train laboratory technicians from other countries as well.

Inter-American Engineering Meeting

The Fourth Conference of the Inter-American Association of Sanitary Engineering will be held in São Paulo, Brazil, July 25–31. An exhibit will be included consisting of engineering equipment and models of construction activities and educational materials relating to sanitary engineering contributions to public health. The conference is sponsored also by the Committee of the IV Centennial of São Paulo and will be part of the scientific event commemorating the 400th anniversary of the founding of the city. Further information from IV Inter-American Conference of Sanitary Engineering, Caixa Postal 8099, São Paulo, Brazil.

The President's Message on Health

The President of the United States delivered to the Congress his recommendations to improve the health of the American people on January 18. He recommended the continuation of present federal programs in health and related fields. With respect to the grant-in-aid programs he recommended a simplification of the present complex formula through a simpler device which would permit the states to use greater initiative and take more responsibility in administration and make federal assistance more immediately responsive to the needs of the separate states.

Three criteria were suggested for grant-in-aid programs:

1. States to be aided in inverse proportion to their financial capacity, as in the Hospital Survey and Construction Act.
2. States also to be helped, in proportion to population, to extend and improve the health service provided by the grant-in-aid programs.
3. A portion of federal funds to be set aside for the support of unique projects of regional or national significance that give promise of new and better ways of serving the human needs of citizens.

New funds recommended are compared with recent appropriations in the table shown below (in millions).

With respect to two current grant-in-aid programs, the President made more specific recommendations. Estimating that there are 2,000,000 disabled persons who could be restored to productive work—and taxpaying status—the President suggested that the current number of 60,000 rehabilitated annually be increased to 70,000 in 1955, to 100,000 in 1956, and to 200,000 by 1959. By 1956 the states should begin to contribute toward the rehabilitation program. To indicate the importance of this rehabilitation program, the President's budget message on January 21, requested an increase of $15,000,000 for rehabilitation for the fiscal year 1955, with a rapid expansion in succeeding years to $120,000,000 in 1959, 78 per cent of which would be the federal share.

The President also made specific recommendations with respect to the construction of medical care facilities. Although estimating that approximately half a million additional hospital beds are needed, he emphasized the need for other types of facilities less costly to

Category	1953	1954	1955
Assistance to States, General	$13.000	$10.135	$11.760
Control of Venereal Diseases	8.100	3.500*	..
Control of Tuberculosis	5.300	4.275	2.000
National Cancer Institute	3.050	2.250	2.250
Mental Health Institute	3.100	2.325	2.325
National Heart Institute	1.500	1.125	1.125

* No funds actually received by states

construct and operate than a general hospital—hospitals for the chronically ill, nursing and convalescent homes, rehabilitation facilities for the disabled, and diagnostic or treatment centers for ambulatory patients.

With respect to meeting the cost of medical care, the President proposed a federal reinsurance service "to encourage private and non-profit health insurance organizations to offer broader health protection to more families" by reinsuring "the special additional risks involved in such broader protection." He estimated that such a plan could be started with a capital fund of $25,000,000, to be retired from reinsurance fees.

Bridge of International Health

In order to explore the possibility of what is called "a two-way bridge of international health," Dr. Hugh R. Leavell, together with Dean James S. Simmons of the Harvard School of Public Health, is on a two-and-a-half month trip around the world. Dr. Leavell, who is professor of public health practice, as president of the American Public Health Association is carrying its greetings to similar organizations in the countries visited. The trip is being financed by the China Medical Board.

The Harvard School of Public Health has 400 alumni working as health leaders in 78 nations throughout the world. About one-third of each year's class comes from outside the United States. In a recent typical class of 121 students, 38 were from 24 countries outside the states. Thus, the school points out that its "teaching, research, and service have always been directed at raising human health standards throughout the world."

The primary purpose of the present journey by Drs. Leavell and Simmons "is to explore with health leaders in several Far Eastern nations the possibility of establishing a long-term two-way 'bridge of health' with a health institution in Asia. This would be a broad, long-range, well financed arrangement involving a two-way flow of teachers, students, administrators, and ideas between the two institutions."

The countries being visited by way of Switzerland, England, and Germany are Pakistan, India, Thailand, Indonesia, Malaya, the Philippines, Hong Kong, Formosa, Japan, and South Korea, with a final stop in Hawaii.

NSCCA Training, Employment Service

The National Society for Crippled Children and Adults has established a Training and Employment Service which combines and intensifies the society's activities in promoting employment opportunities for physically handicapped persons and in recruiting professional personnel for crippled children's work. In addition to encouraging employment of the physically handicapped by business and industry, it also is designed to encourage local Easter Seal societies to use all possible training, counseling, and placement services for handicapped persons, especially since economic security is an important objective in care and treatment.

Raymond L. Kahn, the personnel officer of the society for the past eight years, heads the new Training and Employment Service.

New Lawrence Experiment Station

On December 15, 1953, the Lawrence Experiment Station of the Massachusetts State Board of Health dedicated its new building. "Proud Heritage, 1886–1953" was prepared for this occasion by Raymond S. Patterson, Ph.D., who is also associate editor of the American Journal of Public Health. It recounts the early history of the original research center, its contributions, and particu-

larly those of its outstanding scientists of whom it lists nine on its Sanitary Science Honor Roll, including William Thompson Sedgwick. Keynote of the brochure is taken from the words of Hiram Francis Mills, first director of the Experiment Station, "Invest research with men, brains, ingenuity and teamwork. . . . They are far more important than all your elaborate equipment and costly facilities."

The station was first established in 1886 for the purpose of conducting basic and applied research to the then growing problems of sewage disposal. It has since moved into the field of water supply as well and has made important scientific contributions in each. The chief of laboratory is Joseph A. McCarthy who was for 30 years assistant to his predecessor, George O. Adams. He is a member of the APHA's Committee on Standard Methods for the Examination of Water and Sewage and Committee on Laboratory Methods for Shellfish Examination.

Columbia Awards Honorary Degrees

Columbia University in the City of New York awarded more than 40 honorary degrees at its first bicentennial convocation held on January 11. Among the recipients were the following of special interest in public health:

Haven Emerson, M.D., professor emeritus of public health administration, Columbia University, "Ever active in pushing forward our pioneer efforts in preventive medicine."

Archibald Vivian Hill, honorary professor of physiology, University College, London, "Benefactor of humankind, recipient of the Nobel Prize."

David M. Heyman, president of the New York Foundation, "Founder of a notable health plan, a boon to millions, holding high a Columbia tradition of unselfish public service."

Luther H. Gulick, New York City administrator and president, Institute of Public Administration, "Stalwart citizen."

A "Gripe" Center for Complaints

A number of municipalities—among them Cleveland, Philadelphia, Pittsburgh, Houston, and Norfolk—have organized "gripe" centers at which a citizen registers complaints or comments about any branch of the municipal government, according to "The United States Municipal News," January 15, 1954. The complaint is referred by the "gripe" center to the appropriate branch of city government. City officials of these cities are reported to have found that greater efficiency has resulted from these centers. "Gripe centers help make sure that complaints will get a courteous hearing, will be sent quickly to the proper place, and will be followed up until action has been taken."

Kansas Commission on Alcoholism

A Commission on Alcoholism was established by the 1953 session of the Kansas State Legislature. Under the leadership of a board made up of three physicians, the commission is studying existing needs and facilities for the care and rehabilitation of alcoholics, promoting discussion of problems facing agencies treating alcoholics, making information available for the guidance both of citizens and the courts, promoting research into the factors leading to alcoholism, and preparing recommended regulations for the guidance of state institutions caring for alcoholics.

Academy of Tropical Medicine

At its recent annual meeting in Louisville, Kentucky, November 12, the American Academy of Tropical Medicine elected the following officers for the year 1954:

President—Brigadier General George R. Callender (Ret.), chief of the Pathology Division, Veterans Administration, Washington, D. C.

Vice-President—Captain James J. Sapero,

director, U. S. Naval Medical Research Institute, Cairo, Egypt

Secretary—E. Harold Hinman, M.D., dean, University of Puerto Rico School of Medicine, San Juan

Treasurer—Justin M. Andrews, Sc.D., assistant surgeon general, Public Health Service, and associate chief, Bureau of State Services, Washington, D. C.

Helen Johnson Phaneuf Memorial

The friends and professional associates of Helen Johnson Phaneuf, chief nutrition consultant in the Connecticut State Health Department, who died on December 22, 1953, are establishing an award of merit in her honor. With a minimum of $2,000, it is believed an award of merit can be set up which will stimulate study and research in nutrition and allied fields. Individuals and organizations wishing thus to indicate in a tangible way a suitable tribute to Helen Phaneuf may send contributions to Evelyn Carlson, Treasurer, Helen Johnson Phaneuf Memorial Fund, 151 Farmington Avenue, Hartford, Conn.

PERSONALS

HAROLD S. ADAMS,* assistant professor of public health, Indiana University School of Medicine, Bloomington, was elected second vice-president of the International Milk and Food Sanitarians at the 40th annual meeting in September.

HERBERT K. ABRAMS, M.D.,* medical director of the Union Health Service, Chicago, was recently appointed clinical assistant professor of public health at the University of Illinois College of Medicine.

DONALD B. ARMSTRONG, M.D.,* second vice-president, Health and Welfare Division, Metropolitan Life Insurance Company, New York City, retired December 31 after 37 years of service. He joined the company in 1916 as director of the Framingham Massachusetts Health Demonstration.

JEANIE L. ADKERSON, R.N.,† for the past six years director of nursing services, Southeastern Area Office, Atlanta, Ga., has been appointed assistant director of the American National Red Cross Nursing Service, Washington, D. C., succeeding LONA TROTT,* who retired in September. Miss Adkerson has in turn been succeeded by ELIZABETH KING, R.N., formerly assistant director of nursing services, Alexandria, Va., ARC.

PHYLLIS BERSON,† former nutritionist, Judson Health Center, New York City, is now nutrition consultant, Greater New York Program, National Dairy Council.

HAZEL I. BLAIR, M.D., senior field physician, Alaska Health Department, is on a year's leave to pursue postgraduate studies.

DON E. BLOODGOOD,† chairman of the executive committee of the Indiana State Board of Health and head of the Sanitary Engineering Department, Purdue University, was presented with the Arthur Sidney Bedwell Award at the 26th annual conference of the Central States Sewage and Industrial Wastes Association at Peoria, Ill.

VIRGINIA R. BECKER, for the past 10 years public relations director, Community Welfare Council, Milwaukee County, Wis., is now executive director of the National Publicity Council, succeeding SALLIE E. BRIGHT,† who resigned to join the Department of Public Interest of the Community Service Society of New York.

A. FRANK BREWER, M.D.,* chief, Bureau of Venereal Diseases, California State Department of Health since 1941, has resigned to become Merced County health officer and superintendent of the Merced County Hospital which for the first time have been combined into one position.

JOSEPH CANNON, M.D.,† chief, Chronic Disease and Tuberculosis Control Division, Colorado State Health Department, is on leave to complete requirements for a master of public health degree. In his absence, SIMON P. ABRAHAMS, M.D.,† on loan from the Public Health Service, will serve as chief of the division.

WINSLOW CARLTON,* chairman of the board of the Group Health Insurance and Group Health Dental Insurance, has been elected president, Henry Street Settlement, New York City.

DUNCAN W. CLARK, M.D.,* professor and chairman, Department of Environmental Medicine and Community Health, State University College of Medicine, Brooklyn, N. Y., was elected chairman of the Conference of Professors of Preventive Medicine at a meeting held during the Eighty-first Annual Meeting of the APHA in New York City.

GEORGE J. CLARK,* for the past eight years instructor in sanitary bacteriology, Public Health Service, is now quality control

* Fellow.
† Member.

supervisor, Well's Dairies Co-operative, Columbus, Ga.

MARGERY R. CUNNINGHAM, former information specialist, Public Health Service, has been named staff assistant to LUCILLE M. SMITH,* executive secretary of the National Conference on Care of the Long-Term Patient of the Commission on Chronic Illness.

BERNICE DISESSA, R.N.,† former public health nursing director, El Paso City-County Health Department, has been named director of public health nursing, Colorado State Health Department, Denver.

I. S. FALK, Ph.D.,* since 1940 director of research and statistics, Social Security Administration, Department of Health, Education and Welfare, has joined a Mission to Malaya and Singapore organized by the International Bank for Reconstruction and Development. He is serving as adviser on social services (health, education, welfare, and related activities). The Mission will survey the economies of the two countries and will recommend a program of long-range development. The Mission will be in the field about three months and will return to Washington for report writing to be completed in June. Mr. Falk will be on leave of absence from his present position until June 30, and will not return to it.

EARNEST CARROLL FAUST, Ph.D., professor of parasitology at Tulane University School of Medicine, New Orleans, La., was honored at completing a quarter century at Tulane by the presentation of a portrait and in recognition of his many contributions to parasitology.

WILLIAM F. FINZER, M.D., former director, Guidance Institute of Berks County, has been named director of the Pittsburgh (Pa.) Child Center at the University Medical Center and assistant professor of psychiatry in child development at the University of Pittsburgh School of Medicine.

WILMER FROISTAD for five and a half years director of welfare, Army Office of the Military Government, in Berlin, the last four of which included full responsibility for the Army's public health program for the city, has succeeded HOWARD L. BROOKS as associate director in charge of the Unitarian Service Committee Medical Projects.

WALTER B. FURBUSH, executive secretary of the Albany County (N.Y.) Tuberculosis Association, has been appointed training administrator in the Personnel and Training Division, National Tuberculosis Association.

JOHN T. GENTRY, M.D.,* who was assigned by the Public Health Service as the first full-time health officer for the Greater Anchorage Health District, Alaska, has returned to the New York State Department of Health, Syracuse District Office.

LOUIS A. GOTTSCHALK, M.D., research psychiatrist, Clinical Center of the National Institute for Mental Health, has been named associate professor of psychiatry, University of Cincinnati College of Medicine (Ohio) and attending psychiatrist at Cincinnati General Hospital.

HAROLD S. GRISWOLD,† engineer and acting director, Southwestern Branch Office, Indiana State Board of Health, Washington, has received the John N. Hurty Award for outstanding services to the southwestern section of Indiana in the water works field.

LT. COLONEL MORRIS L. GROVER, M.C.,* formerly instructor in preventive medicine, Brooke Army Medical Center, Fort Sam Houston, Tex., is now director of the Public Health Department, U. S. Civil Administration of the Ryukyu Islands, APO 719, San Francisco, Calif.

DAVID E. HARTMAN, formerly engaged in microbiological research at Camp Detrick, Frederick, Md., has been appointed research associate in epidemiology, University of Michigan School of Public Health, Ann Arbor, Mich.

LYNWOOD HEAVER, M.D., senior consultant psychiatrist, New York Regional Office, Veterans Administration, and panel consulting psychiatrist to the Board of Education, has been appointed medical director, National Hospital for Speech Disorders, New York City.

H. W. HEINZ, D.D.S., former dentist, Beatrice (Neb.) State Home, has been appointed director, Division of Dental Health, Nebraska State Health Department, Lincoln.

ELEANOR HELM, former associate professor of nursing, University of Texas, Galveston, is now director, Department of Baccalaureate and Higher Degree Programs, National League for Nursing, succeeding HELEN NAHM, recently made director of NLN's Division of Nursing Education.

MORTON HILBERT,* director, Bureau of Engineering and Sanitation, Wayne County (Mich.) Health Department, is now serving as news editor for the Conference of Municipal Public Health Engineers.

WILLIAM A. HINTON, M.D.,† director, Wassermann Laboratory, Massachusetts Department of Public Health, since the department initiated its laboratory program for the

* Fellow.
† Member.

detection of syphilis in 1915, retired on December 31.

RUTH BORING HOWARD, M.D.,* former acting chief, Hospitals Standards and Consultation Section, has been appointed chief of the Maternal and Child Health Section, Colorado State Health Department, succeeding CHARLES H. DOWDING, M.D.,† now deputy superintendent, Maternal and Child Health, Milwaukee, Wis., City Health Department.

MURRAY P. HORWOOD, Ph.D.,* who has been on a two-year assignment as chief adviser to the Massachusetts Institute of Technology in the Burma College of Engineering, University of Rangoon, has returned to his position as professor of sanitary science, MIT, Cambridge, Mass.

BRIGADIER GENERAL WAYNE O. KESTER, USAF (VC),† chief, Veterinary Division, Office of the Surgeon General, U. S. Air Force, was elected president of the Conference of Public Health Veterinarians for the year 1954 at its seventh annual meeting in New York City.

EDWARD KUPKA, M.D.,* chief, Bureau of Tuberculosis Control, California State Department of Public Health, is on a two-year leave as public health adviser to the government of Vietnam under the foreign aid program. His address is c/o the American Consulate, Hanoi, Vietnam, French Indochina.

JEROME I. LEVEY, formerly of New York, has recently joined the staff of the Orkin Institute of Industrial Sanitation, Atlanta, Ga., as sanitation consultant.

LT. COLONEL DOUGLAS LINDSEY, MC, AUS,* deputy chief of staff, has been made chief of staff, Medical Replacement Training Center, Camp Pickett, Va.

WALTER E. LOCKWOOD, formerly hospital program representative, Denver Regional Office, Public Health Service, has been appointed director of the Kellogg Foundation study on chronic illness and aging in the Colorado State Health Department.

FRED LONG, M.D.,* health officer of Peoria City and Peoria County, Ill., is the American Public Health Association representative to the Industrial Safety Conference, National Safety Conference.

DOROTHY C. LOWMAN has returned to the Utah State Health Department as director of the Public Health Nursing Division, a position she formerly held for six years during and following World War I.

GENEVA F. LUNDBERG,† recently with the Division of Chronic Disease and Tuberculosis, Public Health Service, is now medical social consultant, Commission on Chronic Illness, detailed to the Johns Hopkins Hospital where the medical social evaluation of a sample of Baltimore's citizens is taking place.

JACK MATHEWS,† formerly head of the Department's Health Education Section, has recently been appointed executive assistant to JOHN A. KAHL, M.D.,* acting director of health for the State of Washington, Seattle.

ORVILLE L. MEYER, B.S., M.S.C.E., since 1941 with the Public Health Service Communicable Disease Center, Atlanta, Ga., is now director of the Sanitation Division, Dupage County (Villa Park, Ill.), succeeding KENNETH BAUMANN, now with the Illinois Department of Public Health Regional Office in Champaign.

H. CLIFFORD MITCHELL,† former chief, Bureau of Sanitation, Richmond (Va.) Department of Public Health, is now director of sanitation, St. Louis County Health Department, Clayton, Mo.

ROBERT A. MOORE, M.D., dean of the Washington University School of Medicine, St. Louis, has been named vice-chancellor in charge of the schools of the health professions at the University of Pittsburgh. He has been succeeded by CARL V. MOORE, M.D., professor of medicine at Washington University School of Medicine.

RALPH S. MUCKENFUSS, M.D.,* formerly deputy commissioner of health, New York City Health Department, is now scientific director of the Naval Biological Laboratory, Naval Supply Center, Oakland, Calif.

CHARLOTTE MUGNIER,† formerly with the New Orleans and Louisiana Tuberculosis Associations, is now public health education consultant, Washington State Department of Health, Seattle.

MURRAY R. NATHAN,† director, Office of Planning and Procedures, New York State Health Department, was elected president of the Association of Business Management in Public Health at its annual meeting in New York City in November.

JAMES C. PARSONS, former clinical psychologist at Harding Sanitarium in Worthington, Ohio, has joined the Alaska Department of Health, Mental Health Section, Anchorage, as clinical psychologist, succeeding WILLIAM A. MACOMBER, who resigned to accept a position in the states in order to complete university requirements for the doctoral degree.

ARTHUR B. PRICE, M.D.,† former director, Chicago Regional Office, Department of Health, Education and Welfare, has been

* Fellow.
† Member.

appointed director, health resources staff, of the Office of Defense Mobilization, Washington, D. C., succeeding W. H. AUFRANC, M.D.,* who has returned to the Public Health Service.

CHARLES J. PROHASKA, M.D.,* consultant in health and physical education, Connecticut State Department of Education for 25 years, retired in December, 1953.

GLADYS RAY, R.N.,† has been loaned to the Colorado State Health Department, Denver, by the Public Health Service as consultant in tuberculosis and chronic illness.

FRANKLIN H. REEDER, JR., M.D.,* previously chief of preventive medicine, 2843 Medical Group, Olmstead Air Force Base, Pa., with the rank of Major, has been named district health officer for Montgomery County by the Pennsylvania State Health Department. His headquarters are in Norristown.

KATHRYN A. ROBESON,† regional nursing consultant for the Children's Bureau, Denver, Colo., and NANCY MCMURRAY,† assistant supervising nurse in the Washtenaw (Mich.) County Health Department, have been named resident lecturers in public health nursing, University of Michigan School of Public Health, Ann Arbor.

MICHAEL A. ROSSETTI, formerly in the Hartford Health Department, has been appointed sanitary inspector, Connecticut State Department of Health, succeeding the late EDWARD B. NOONAN.

DEATHS

WILLIAM O. BUETTNER,† executive secretary, National Pest Control Association, New York, N. Y. (Engineering Section).

COLONEL CHARLES E. COCKS, JR., M.C.,† professor of military medical science, University of California Medical School, University Medical Center, San Francisco, Calif., on September 29, 1953 (Medical Care Section).

BESS EXTON,* of Ukiah, Calif., on June 20, 1953 (Public Health Education Section).

HARRY T. FOLEY, II, M.D.,† of Pittsburgh, Pa. (Medical Care Section).

KATHERINE J. MACGREGOR, R.N.,† of Butte, Mont., on October 16, 1953 (Unaffiliated).

HERBERT L. MANTZ, M.D.,* past president of the National Tuberculosis Association and tuberculosis controller for the Kansas City Health Department since 1935, on December 14, 1953, at the age of 57 (Medical Care Section).

HELEN JOHNSON PHANEUF,† member of the nutrition staff, Connecticut State Department of Health, Hartford, on December 22, 1953 (Food and Nutrition Section).

SUSIE M. RICE, R.N.,† Crockett County Health Dept., Alamo, Tenn. (Public Health Nursing Section).

MILO P. RINDGE, M.D.,† of Madison, Conn. (Unaffiliated).

JOSEPH A. ROBINSON, M.D.,† of New Bethlehem, Pa., on November 26, 1953 (Unaffiliated).

ERICH SELIGMANN, M.D.,* bacteriologist, Beth Israel Hospital, New York, N. Y., on January 1 (Epidemiology Section).

CONFERENCES AND DATES

American Public Health Association. Headquarters: Memorial Auditorium, Buffalo, N. Y. October 11–15.

State and Regional Public Health Meetings:

Arizona Public Health Association. Santa Rita Hotel, Tucson. April 29–May 1.

Cuban Public Health Society. Finlay Institute, Havana. April 24–25.

Georgia Public Health Association. DeSoto Hotel, Savannah. May 3–5.

Idaho Public Health Association. Shore Lodge Hotel, McCall. May 7–8.

Illinois Public Health Association. St. Nicholas Hotel, Springfield. April 1–2.

Indiana Public Health Association. Indianapolis. May 5–6.

Iowa Public Health Association. Fort Des Moines Hotel, Des Moines. April 8–9.

Kansas Public Health Association. Hotel Lassen, Wichita. March 29–31.

Louisiana Association of Public Health Workers. Virginia Hotel, Monroe. April 8–9.

Massachusetts Public Health Association. Massachusetts Institute of Technology. Cambridge. April 29.

Michigan Public Health Association. Detroit. May 5–7.

Middle States Public Health Association. Hotels St. Paul and Lowry, St. Paul, Minn. June 2–4.

Minnesota Public Health Conference (with Middle States Public Health Association). June 2–4.

Missouri Public Health Association. Hotel Robidoux, St. Joseph. May 6–8.

New Mexico Public Health Association. Albuquerque. April 4–6.

New York State Public Health Association. Lake Placid Club, Lake Placid. June 7–10.

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* Fellow.
† Member.

Ohio Public Health Association. Deshler-Hilton Hotel. Columbus. May 25–26.

South Carolina Public Health Association. Ocean Forest Hotel, Myrtle Beach. May 27–29.

Southern Branch, APHA. Soreno Hotel, St. Petersburg, Fla. April 21–23.

Tennessee Public Health Association. Andrew Jackson Hotel, Nashville. May 13–15.

United States-Mexico Border Public Health Association. Albuquerque, N. M. April 7–9.

Washington State Public Health Association (with Western Branch, APHA). May 9–12.

Western Branch, APHA. Olympic Hotel, Seattle, Wash. May 9–12.

Meetings of Other Organizations Coming in March, April, and May:

Air Pollution Control Association. Patten Hotel, Chattanooga, Tenn. May 3–5.

American Academy of Political and Social Science. Benjamin Franklin Hotel, Philadelphia, Pa. April 2–3.

American Association of Health, Education and Recreation. New York, N. Y. April 18–23.

American Association of Medical Social Workers. Atlantic City, N. J. May 11.

American Heart Association. Conrad Hilton Hotel, Chicago, Ill. April 1–2.

American Medical Association—National Conference on Rural Health. Baker Hotel, Dallas, Tex. March 4–6.

American Nurses' Association. Chicago, Ill. April 26–30.

American Psychiatric Association. St. Louis, Mo. May 3–7.

American Social Hygiene Association. New York, N. Y. April 26.

American Society for Public Administration. Conrad Hilton Hotel, Chicago, Ill. March 19–21.

American Water Works Association. Seattle, Wash. May 23–28.

Association of Schools of Public Health, Ann Arbor, Mich., April 4–6.

Child Study Association of America. Annual Conference. New York, N. Y. March 1–2.

Commission on Chronic Illness. National Conference on Care of the Long-Time Patient. Chicago, Ill. March 18–20.

Industrial Medical Association. Hotel Sherman, Chicago, Ill. April 26–30.

National Conference of Social Work. Atlantic City, N. J. May 9–14.

National Conference on Health in Colleges (Fourth) Hotel Statler, New York, N. Y. May 5–8.

National Conference on Trichinosis (Second). Auditorium, American Medical Association, Chicago, Ill. March 1.

National Health Council. Hotel Statler, New York, N. Y. March 24–26.

National Multiple Sclerosis Society. Annual Meeting. New York, N. Y. March 9 (tentative).

National Society for the Prevention of Blindness. Hotel Jefferson, St. Louis, Mo. March 10–12.

National Tuberculosis Association. Atlantic City, N. J. May 17–21.

Planned Parenthood Federation of America. Waldorf-Astoria Hotel, New York, N. Y. May 4–6.

Public Health Conference on Records and Statistics. Fifth National Meeting. Washington, D. C. March 22–26.

The Royal Sanitary Institute. Health Congress at Scarborough, England, April 27–30.

World Health Organization. Seventh Meeting of the World Health Assembly. Geneva, Switzerland. May 4.

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(1) Hopkins, J. G.: AMA Arch. Dermat. & Syph., 67:479-483 (1953).
(2) Sullivan, M., and Bereston, E. S.: J. Invest. Dermat., 19:175-178 (1952).

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